The Builder.

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ILLUSTRATIONS.

Entrance to Assize Courts, new Law Courts, Cardiff.—Messrs. Lanchester, Stewart, & Rickards, Architects ..... *Four-Page Photo-Litho.*
Nurses' Home, Brompton Consumption Hospital.—Mr. E. T. Hall, F.R.I.B.A., Architect ..... *Double-Page Photo-Litho.*
Country House, Fittleworth, Sussex.—Mr. R. S. Balfour, A.R.I.B.A., Architect ..... *Single-Page Ink-Photo.*
Lyddington Bede House.—Mr. R. S. Balfour, A.R.I.B.A., Architect ..... *Single-Page Ink-Photo.*
Designs for Friezes, &c., by various artists ..... *Double-Page Ink-Photo.*

Blocks in Text.

Plans Illustrating the Evolution of the New York Tenement.. Pages 168, 169
Entrance to Assize Courts, Cardiff. Plan. ..... Page 178
A Walk in Saragossa ..... Pages 174, 175, 176

CONTENTS.

Dwellings for the Poor in New York 167
The National Physical Laboratory 169
Notes 170
Competition for Kursaal, Harrogate 172
The Building Trade Dispute 173
A Walk in Saragossa 174
Applications under the 1894 London Building Act 176
Illustrations:—
Entrance to Assize Courts, Cardiff 178
Royal Hospital for Consumption, Brompton, London 178
Country House at Fittleworth 178
Lyddington Bede House 178
Designs for Friezes, &c. 178
Ham Green Hospital, Bristol 177
Trade Catalogues, &c. 178
Books Received 179
Correspondence:—
Newcastle-upon-Tyne Royal Infirmary Competition 179
Sanitary Inspectors' Examination Board 179
Aldershot Masonic Hall Competition 179
The Student's Column. Roads: Their Construction and Maintenance.—I. Materials (continued) 179
Obituary 181
General Building News 181
Sanitary and Engineering News 182
Foreign 182
Miscellaneous 183
Capital and Labour 183
Legal:—
Charnock *v.* Court 183
Architect *v.* Builder 184
An Architect's Claim for Abandoned Schemes 184
Ancient Light Dispute Case in the Vacation Court 184
Compensation for Ancient Lights 184
Meetings 184
Recent Patents 184
Some Recent Sales of Property 185
Prices Current of Materials 185
Tenders 187

Dwellings for the Poor in New York.

DURING the past generation a large share of public interest has been taken in the subject of dwellings for the poor in all the large cities of the world. New York has, of recent years, been working out its own quota towards the solution of this problem, and has, perhaps, been as successful in its results as many other cities. To most persons on this side Atlantic it will, no doubt, seem strange, at first sight, when they are told that New York has some of the worst slums in the world; but the causes that created the trouble in the old world have been intensified by the more rapid growth of cities in the new world.

To understand thoroughly the problem which has been before the inhabitants of New York, it will be necessary to consider the difficulties with which they have had to contend. These may be ranged under two headings:—

1. The restricted building area of the lower end of New York, which has brought about the fabulous price of the land in that quarter.

2. The manner in which the land is subdivided, that is, in lots with 25 ft. frontage and 100 ft. deep.

The first of these two evils cannot be changed, on account of the shape of the island on which New York is built. The second, however, can be both altered and obviated in such a manner as to be no longer a drawback and bugbear, which, until a few years ago, it seems to have been. It will be the purpose of this article to show how and why.

When the city of New York was first settled, the lower, or what is called in the city the "Battery" end, was the district in which the influential citizens built their homes. These houses were generally built somewhat as shown on plan No. 1, which gave the occupiers plenty of fresh air and sunlight. But as trade increased—and increase it did very rapidly—these houses of the better classes were deserted by their owners, who went farther and farther north, leaving their old buildings to be occupied by the mechanic and the labourer. This class being, however, unable to pay high rents, their merchant landlords were forced to do something to make these houses pay. So they crowded more families on each floor than formerly occupied the whole house, and in order to do this the building was altered as shown on plan No. 2.

Land, however, grew in value, and landlords were dissatisfied with the returns they were receiving from their property, so they tried to form some scheme by which they might enlarge their rental space. This was generally done by erecting a second building at the rear of the lot, leaving an open space between, which was entered by an archway made in the front building. The result was as shown in plan No. 3.

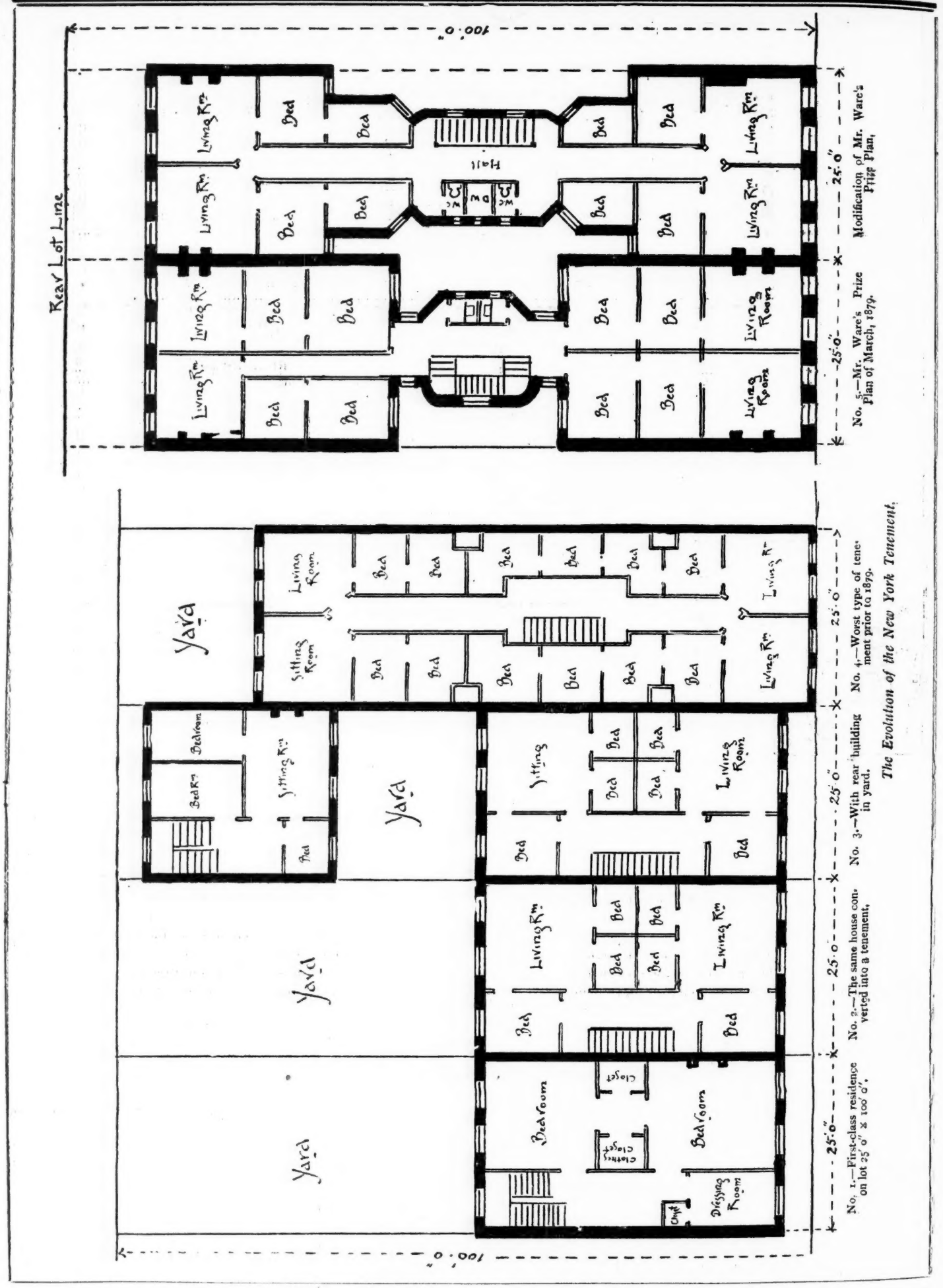
By this time, however, buildings were being erected expressly for the purpose of dwellings for the poor, and were more often than not as shown in sketch No. 4, which, as a glance will show, is about as bad as the human mind could conceive. There is absolutely no redeeming point in this plan, and from whatever standpoint one views it, its faults stare one in the face. It is bad enough in any city to see the old buildings fall out of repair and gradually become veritable hovels, but when new buildings were erected with the object of packing as many human beings as possible into a building without one thought for their health or their morals, it was time for citizens who had the welfare of their city at heart to stand up and proclaim against such buildings. The first move in the right direction was made in 1879, and a feeling of shame was steadily growing against this state of affairs. It was during this time that a model house competition was held, and it was won by Mr. James E. Ware, a New York architect. His plan, which is shown in sketch No. 5, though somewhat of an improvement on plan No. 4, is very far indeed from what it should be. Since then, various attempts have been made to improve upon this plan, and Mr. Ware himself has made several which have been largely used, but the faults are all more or less the same, and are mostly impossible to avoid as long as these structures are built on a lot 25 ft. by 100 ft. This Mr. Ernest Flagg very ably pointed out in an article on "The New York Tenement House Evil and its Cure." He says, "No satisfactory tenement, from both the commercial and sanitary standpoint, can be erected, under the conditions which prevail in New York, upon a lot 25 ft. by 100 ft., or one of about those dimensions, for if a sufficient space be left vacant to properly light the interior, the building cannot be profitable owing to the high price of land; and if enough land is covered to make the building profitable as an investment, the interior cannot be properly lighted and ventilated."

This, then, may be taken as an axiom, that the nearer the square the more economical will be the building, and if further and simpler proof is required, take a house 20 ft. by 20 ft. and one 40 ft. by 10 ft. Each will contain 400 square feet, yet the first will only require 84 ft. of 12 in. wall, while the other will require 104 ft., besides requiring more fireing, lathing, and plastering.

One would have thought Americans would have grasped this solution of their trouble before this, but they have now started on a new era, and sound, healthful, sanitary, economic buildings are now being erected in place of the former immoral, insanitary fire-traps.

The French were far ahead of the Americans, and grasped the problem better, as can be seen in most of the Parisian "flat" buildings, which generally have a frontage of 75 ft. to 100 ft. and are built round a courtyard. Buildings have been erected in New York since the eighties more or less on this plan, which have been more successful even if not a complete success.

Most of these buildings are six stories in height, and cover from 60 to 70 per cent. of the land. Rents in these buildings



No. 5.—Mr. Ware's Prize Plan of March, 1879. Modification of Mr. Ware's Prize Plan.

No. 4.—Worst type of tenement prior to 1879.

No. 3.—With rear building in yard.

No. 2.—The same house converted into a tenement.

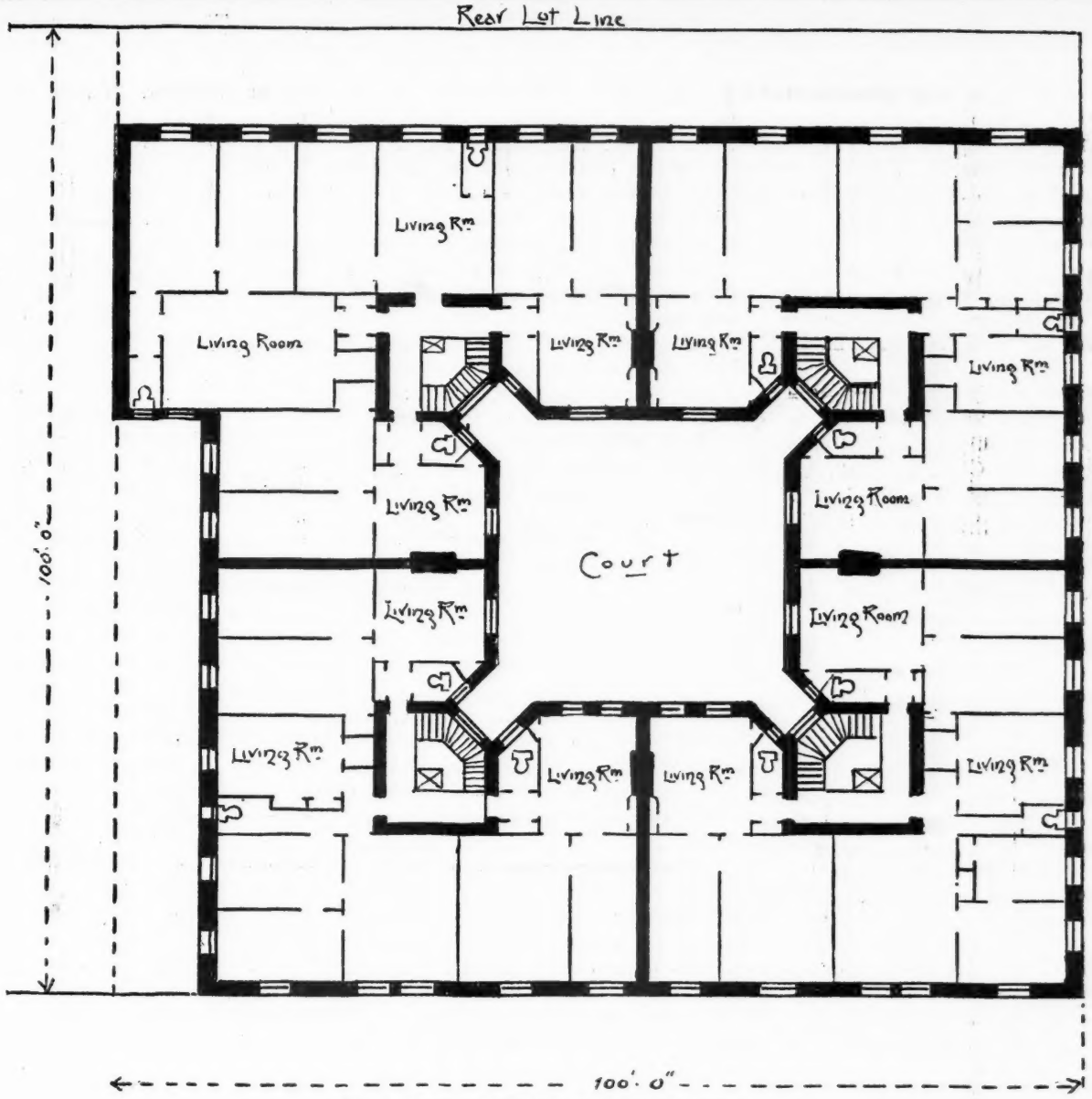
No. 1.—First-class residence on lot 25' 0" x 100' 0".

The Evolution of the New York Tenement.

are usually from 80 cents to 85 cents per room per week, and pay on an average to the owners 4 to 6 per cent. dividends. There is no reason why a building erected in a favourable locality in New York on a sound economic basis should not pay the investor a 5 per cent. dividend. It was on this basis that the "City and Suburban Homes Company" was formed in New York, with some of the most prominent New York citizens at its head. They issued an invitation to architects about two years ago to compete for plans required for a tenement, and the competition was won by Mr. Ernest Flagg, of New York. It may be observed that in this plan, which is shown at fig. 6, there is no waste space in passages and yet no bedroom enters from another bedroom, and every room is lighted from the street or from the large courtyards.

It has been computed that as between a building planned similar to Mr. Flagg's plan, and one planned as Mr. Ware's plan shown at fig. 5, there would be a saving of 15 per cent. of the cost in favour of the former—besides being vastly better from a sanitary, moral, or any other point.

This is the most practical way to bring about reform. Show the landlords that the good, sound, healthful building costs less



No. 6.—Tenement House built on the plan of a square.

The Evolution of the New York Tenement.

than the one constructed on unsound principles, and contravening every moral and sanitary law, and you hit them at their weakest spot, viz., their pockets.

This will show what has been doing in recent years to improve the welfare of the mechanic and the labourer in the city of the New World, and it will bear comparison with the good work which has been going on simultaneously in all the large cities of the world. Every city may have peculiar difficulties with which to contend, but obstacles in one country, when overcome, will doubtless help others to overcome theirs, and we may look forward to a day not far hence when in all large cities one may see labourers in healthful homes at a reasonable rental, and at the same time the buildings giving a fair interest on the capital invested by the owner.

THE NATIONAL PHYSICAL LABORATORY.

THE Report of the Committee appointed by the Treasury to consider the desirability of establishing a national physical laboratory was issued on Monday last, the 14th inst.

The first recommendation is—"That a public institution should be founded for standardising and verifying instruments for testing materials, and for the determination of physical constants." All who have had to do with testing of materials of construction will hail this recommendation with complete satisfaction. For many years some such institution has been advocated in the columns of the *Builder*. It is an open secret that the Treasury is determined to found a scientific establishment in order that applied physics shall not be left entirely at the mercy of commercial houses, or of professional testers in public schools. The proposed laboratory being directly under the ægis of the Government, we may hope for the official publication of the results of all materials tested, as well as the mere verification of the instruments employed. We have no doubt that that is contemplated. At present, whilst no one would call into question the accuracy of the actual tests made by private individuals and business firms, there is the impossibility of being able to satisfactorily compare the results obtained even with the same class of materials, because all experimenters do not adopt similar methods, nor are the substances tested in any particular class of a uniform character. Take bricks, for instance; some experimenters deal with half bricks, others with whole ones, and then, by a species of multiplication, the strength of the half is calculated with reference to a whole brick of the same kind. If anything is clear in the heterogeneous matter published with reference to tests on bricks, it is that, to be strictly comparative, the pieces tested should be of the same size and shape. Again, it is useless to compare results of brick testing on frogged bricks unless the frogs are in some way described. It may be argued that all the architect wants to know is the strength of the actual brick he contemplates using. That is true enough, but where strength (as in piers) is a prime object, he will be sure to be guided by the comparative results sent to him, although the parties sending are interested. The unofficial experimenter, as a rule, does not himself select the bricks he deals with, he merely carries out his investigations on the materials sent to him. This is not at all satisfactory, and under Government auspices we may hope for some improvement in this direction. The same observation applies to the testing of stone, cement, mortar, girders, columns, and in fact, nearly all materials of construction.

Another phase of this question, is that there can be no reason why these materials should not be officially tested, and in the case of a wrong description by means of which the trader evidently intended to defraud, he ought certainly to be subjected to legal proceedings, in the same way as offenders under the Food and Drugs Act. As matters stand at present, even where the architect knows

that the materials supplied are not those which he ordered, all he can do is to reject them. The sender takes his chance, and though he may fail in some instances, he often succeeds. We are not without hope, therefore, that the work of the proposed national physical laboratory may be of some practical use to architects, and be a boon to honest manufacturers of materials of construction by weeding out the dishonest ones. But all this is for the future, and though it is proverbially dangerous to prophesy, we feel sure that what we have just indicated will come to pass in the long run.

The second conclusion arrived at by the Committee is "That the Institution should be established by extending the Kew Observatory in the Old Deer Park, Richmond, and that the scheme should include the improvement of the existing buildings and the erection of new buildings at some distance from the present Observatory." We have already alluded (p. 99 *ante*) to the difficulties in selecting a suitable site for the buildings, and have nothing to add to what was then said.

The third recommendation is "That the Royal Society should be invited to control the proposed Institution, and to nominate a governing body on which commercial interests should be represented, the choice of the members of such body not being confined to Fellows of the Society." It may well be doubted whether the Royal Society is the best body to control the Institution; but, at any rate, that is better than that it should be directly subjected to bureaucratic influence, with the inevitable Civil Service scientists "by examination" in sole charge. Our only doubt is as to whether the Royal Society is equal to giving due consideration to the commercial aspects of the various branches of physics, in spite of the recommendation that "commercial interests should be represented." However, we will not seriously complain of the proposed constitution of the governing body. If it is not found to work satisfactorily, it can soon be altered.

The fourth and last conclusion of the Committee is "That the permanent secretary of the Board of Trade should be an *ex-officio* member of the governing body, and that such body should be consulted by the standard office and the electrical standardising department of the Board of Trade upon difficult questions that may arise from time to time, or as to proposed modifications or developments." This is tantamount to recognising the proposed laboratory as an official medium for investigating difficult physical problems which affect the public welfare. If this recommendation is carried out, there will no longer be any question as to who is to investigate particular instances of explosions in street boxes connected with electrical mains, the bursting of cylinders containing compressed gases, and the like.

The Report is signed by Lord Rayleigh, Sir Courtenay Boyle, Sir A. Noble, Sir J. Wolfe Barry, Mr. W. C. Roberts-Austen, Mr. Robert Chalmers, Mr. Arthur W. Rucker, Mr. Alexander Siemens, and Mr. T. E. Thorpe.

NOTES.

Secret Commissions.

We are glad to see that the London County Council has instituted a prosecution in regard to the alleged attempt to bribe one of its officials in regard to a purchase of land. Equally the official in question is to be congratulated on his public spirit. Lord Russell's Bill has fallen, for the session at any rate: almost as much good would be done if all public bodies and officials would sternly set their faces against secret commissions. A good salary is the first safeguard. Well paid officials have no need to take commissions, but an absolute determination on the part of public authorities to put an end to the system would have a great effect throughout the country. Every one knows that secret commissions are given and taken, but how seldom do we hear of any action of a criminal character being taken in regard to them. We say nothing as to the facts of the case to which we have alluded, as it is, in a sense, *sub judice;* but the mere fact that the London County Council have instituted a prosecution is satisfactory.

Ranworth Church, East Norfolk.

An appeal is made for subscriptions towards a sum of 4,350*l.* to defray the total cost of some necessary repairs at St. Helen's parish church, where the building of a new roof has already been begun, under the superintendence of Mr. Micklethwaite. The fourteenth century church, of which the old richly-carved and gilded timber roof was removed ninety years ago, can boast of one of the finest rood-screens in the country. It is conjectured that the painted work was executed in the fifteenth century by some artists travelling from the Netherlands or Lower Rhine, yet it bears indications of a purely local influence, which separates it from the category of an exclusively foreign school. A considerable portion of the sculpture has been preserved, whilst the faces of the Apostles and Saints are nearly obliterated. It is stated that no restoration—in the ordinary sense of the word—of the paintings will be attempted.

Caerwent Exploration Fund.

It is proposed to excavate and explore some portion of the Roman remains at Caerwent, in Monmouthshire, the site of the ancient Venta Silurum, and donations are invited for the purpose from those interested in such work. From some particulars issued by the Preliminary Committee, it is stated that the City of Venta Silurum is situate on the Roman road between Isca Silurum (Caerleon) and Chepstow, and was one of the stations on the XIV. iter in the Antonine Itinerary. The city itself is rectangular (about 500 × 400 yards in extent), and a large portion of the ancient city wall is still standing. Relics of the Roman city are constantly being found, including several fine pavements; but the only systematic exploration that has been carried out was done by Mr. Octavius Morgan in 1855, when a house and some baths were excavated in the south-east quarter. A fine set of baths was discovered here, and a pavement which, with other things, was removed to Caerleon. With this exception, the Roman antiquities found in this interesting site have perished, and no record has been preserved until the year 1893, when Mr. Milverton Drake, in conducting some building operations, found another house, and planned as much of it as time would permit. The houses and cottages of the more modern village of Caerwent will prevent a large part of the site being explored, but there are still some fields unoccupied by houses, and it is proposed to systematically excavate these and carefully plan the streets and houses, as has been done at Silchester. If possible, the cemeteries will also be explored. The executors of the late Mr. Lysaght have given their permission to begin this summer with a field of about nine acres in the south-west quarter of the city. Donations may be sent to the Hon. Treasurer, Mr. A. E. Hudd, F.S.A., 94, Pembroke-road, Clifton.

Fire-Proof Construction.

Some features of the structural design of buildings have recently been discussed by the Franklin Institute, of Philadelphia. Although by no means neglected, the subject is one which will bear further consideration in this country. On the occasion in question, it was pointed out that for a building to be fire-proof, in the true sense of the term, the interior fittings and furniture must, as far as possible, be of non-burning material. Testimony is forthcoming almost daily in support of this self-evident proposition, but we fear that so long as feminine taste directs such matters of domestic detail, any important reforms may involve an interval of uncertain duration. Results of experiments are quoted showing the behaviour of various columns under fire. From these tests, conducted by a joint committee of architectural and engineering experts in New York, it appears to be established that at temperatures of from 1,200 deg. to 1,300 deg. Fahr. both steel and cast-iron columns carry somewhat less than one-quarter of their ultimate resistance at ordinary temperatures. It should be stated that the thickness of the steel columns did not exceed $\frac{5}{16}$ in., while the cast metal averaged 1 in. Numerous experiments elsewhere have shown that when the metal is properly insulated its carrying capacity is very little diminished. For the protection of iron and steel members of a building framework a properly jointed casing of tiles or terra-cotta is recommended, but care must be taken that the material is one not liable to crumble or break away during or after a fire. Plastering on wire netting or expanded metal is found to exhibit very little tendency to crumbling on exposure to fire and to fire streams. As illustrating the advantage of such protective coverings, we may refer to the well-known fact that steam boiler-plates are frequently rendered brittle owing to the absorption of gases from the fuel. Probably the most important part of fire-proof construction is centered in the floors of a building. Owing to its large area a floor suffers the most severe attacks during a fire, and upon its resistance depends the gravest consequences. In addition to its own weight, other heavy and frequently accidental loads have to be carried whilst under the influence of high temperatures and the impact of fire streams. In order to gain further knowledge in respect of this question, a very complete series of investigations was conducted in 1897 by the Department of Public Buildings of New York, which covered all the more prominent systems of construction used at the present time. Each kind of floor was tested under similar conditions over a specially built furnace, and the inquiry involved not only subjection to temperatures ranging up to 2,200 deg. Fahr., but also to the effects of fire streams at 60 lbs. pressure for periods of from fifteen to twenty minutes.

The total duration of each fire test was five hours, and the floors carried an extraneous load of 150 lbs. per square foot. After the cooling of the furnace, the load on each floor was increased to 600 lbs. Results ascertained were somewhat varied, but it appears they were in the main of a satisfactory character. Some plaster and hollow tile surfaces fell or crumbled off, although generally without serious injury to the carrying capacities of the floors. Concrete was found to suffer very little, and concrete combined with wire netting stood remarkably well. These experiments have since been confirmed by experience gained in actual conflagrations in various parts of the United States. In previous issues we have pointed out the great accession of strength and consequent reduction of weight rendered possible by the employment of a metal meshing in the construction of fire-resisting floors.

Modern Contractors' Plant.

AN excellent example of the complete utilisation of mechanical appliances in the execution of a large contract is afforded by the works in connexion with the extensions at Keyham Dockyard. Here, as would naturally be expected, blasting, excavation, and transport are facilitated by such direct and auxiliary apparatus as compressed air rock-drills, steam navvies, steam cranes, pile-driving engines, pumps, and a complete railway system. There are, in addition, several mud-scoops of special design, hauled to and fro, and controlled in operation by chains attached to hauling engines at each end. These scoops discharge direct into hopper barges, emptied at sea, and have very greatly reduced the labour of removing large quantities of mud, which could not have been readily dealt with by the aid of ordinary appliances. Sand and shingle are raised at Starts Bay by suction dredgers, and unloaded at the contractors' jetties by grabs, each capable of discharging sixty-five tons per hour. At the same jetties four 10-ton steam cranes are at work day and night dealing with deliveries of general materials at the rate of about 35,000 tons per month. Building work is aided in every possible way by machinery, and all concrete is prepared in mechanical mixers, ejecting measured quantities into skips, which are taken on trucks direct to the required sites by locomotives. Engineering and other workshops on the site include a foundry, smithies, fitting-shops, carpenters' shops, saw-mills, &c. An electric light installation, comprising thirty-two arc lamps and 350 incandescent lamps, gives facility for the conduct of operations during the night, and, in addition, there are forty Wells' lights in use at various points. Steam engines on land represent over 725 horse-power, without reckoning direct steam-driven machinery, and, besides, there are fourteen locomotives and nine gas and oil engines. Steam cranes, with a total capacity of 360 tons, are at work, to say nothing of steam winches, whilst the floating plant includes four tugs of 1,600 collective I.H.P. and barges with a total displacement of about 10,000 tons. It is, of course, only in connexion with the largest undertakings that mechanical aids can be invoked to such an extent as that indicated above, but every one concerned in public or other contracts will perform useful service if he become instrumental in promoting the employment of the most approved modern appliances.

Lightning Arresters.

THE protection of electrical plant, especially that connected with traction, against lightning, is a problem that has exercised the skill of electrical engineers for the last ten years. Many solutions have been given ranging from the simple expedient of earthing the line by connecting it with a carbon rod immersed in a water-tank, to the elaborate apparatus devised by the Thomson-Houston and Westinghouse Companies. Amongst the many lightning arresters in the market the best known are those devised by Mr. Wurts, and, consequently, his article on lightning arresters in the current number of the *Century Magazine* has attracted a good deal of attention. He starts with giving an intelligent *résumé* of the theory of the subject. He states, as a fact, that lightning flashes are oscillatory, and mentions that in ordinary flashes about twelve discharges may be observed at intervals of about one hundred thousandth of a second. If this be true it will be a remarkable confirmation of Dr. Lodge's theory advanced some twelve years ago. Mr. Wurts insists rightly that there is no special reason why a long horizontal wire, such as a trolly wire, should be struck by lightning, and mentions that such a contingency rarely occurs. During a thunderstorm, however, the wire acquires an electrostatic charge which surges along it, and although the sparks caused are small, yet, as they have the dynamo pressure of 500 volts, they may easily, by piercing the insulation, cause a short circuit which would burn out the dynamos. Mr. Wurts, in this article, describes his latest form of lightning arrester. He reverts to the old principle of the non-arcing metals, like zinc and mercury. It is well known that it is impossible to maintain an electric arc between certain metals, and hence the arc caused by the spark goes out of itself. He does not give the composition of the alloy he adopts, but it apparently is very efficient. As his apparatus contains no moving parts and is independent of fuses, it is excellently adapted for its purpose.

Duration of Iron or Steel Bridges.

THERE is a popular belief that the average life of a steel bridge is limited to a few years, in consequence of a supposed process of crystallisation taking place within the metal itself. In answer to a correspondent, the *Scientific American* points out that the permanence of a bridge of this class depends on three conditions: the design, the loading, and the maintenance. If properly designed for a specified maximum load, if care be taken that this load is never exceeded, and if the steel work be thoroughly accessible and painted at regular intervals, there is no reason why a bridge should not last for centuries. The first two conditions are generally carefully looked after in this country, and the importance of the third is duly recognised. We question, however, if sufficient attention is invariably paid to cleaning as a preliminary to painting. Painting in itself is no protection, unless the surface of the metal be thoroughly cleansed. Otherwise the paint merely hides the process of oxidation going on underneath, and gives a false sense of security. Consideration of this point is still more essential in respect of ironwork hidden away in modern buildings, and it would be very desirable if "rust-resisting," as a term qualifying building construction, became a more familiar one in our ears.

A Memorial to William Blake.

A MEMORIAL sculptured in bronze and Irish marble, by Mr. Nicholls, and bearing a medallion likeness of the poet (after his portrait by Phillips) with a bas-relief of his own "Death's Door," will shortly be set up in the Lambeth Central Library; the inscription is written by Dr. Richard Garnett. Blake, the son of a hosier, and born on November 28, 1757, at No. 28, Broad-street, near Golden-square, was apprenticed to Basire for whom he drew the monuments in St. Paul's and Westminster Abbey, for Gough's "Sepulchral Monuments." After his marriage at Battersea (1782) to Katharine Boucher, he lodged at No. 23, Green-street, Leicester-square, and two years later, together with Parker, opened a print-shop at No. 27, Broad-street, next door to his father. We may follow him thence to No. 28, Poland-street, where his wife helped him in the production of his "Songs of Innocence," and in 1793 to Hercules-buildings, Lambeth, where he lived seven years, his work during the last-named interval including "America," "Europe" (having "The Ancient of Days" for its frontispiece), "The Book of Jerusalem," "The Gate of Paradise," and "Young's Night Thoughts." After a sojourn of three years at Felpham, whither Hayley invited him to illustrate his "Life of Cowper," he removed to No. 17, South Molton-street, Oxford-street. There he lived seventeen years, and produced his "Jerusalem" and illustrations to Blair's "Grave." Cromek, the publisher, paid Blake one guinea a-piece for the latter, but to his great mortification employed Schiavonetti for their engraving. The last seven years of his life were passed in Fountain-court, Strand, his latest work being "Inventions to the Book of Job," for John Linnell, and some illustrations to Dante, and there in the back room on the first floor of No. 3, his life closed, August 12, 1827. He was buried (says J. T. Smith in "Nollekens and his Times") in a grave numbered "80," about 25 ft. from the north wall of Bunhill Fields Burial Ground.

"Tom's" Coffee-house, Covent Garden.

SOME interesting relics of the old coffee-house were sold at Sotheby's in the course of last month. Amongst them were the tortoise-shell and silver snuff-box, bearing the busts of Charles I. and Queen Anne in relief, the club book with a list of members—Foote, Lord Clive, Garrick, Dr. Johnson, Goldsmith, the Marquis of Granby, &c.—and the portrait of Richard Haines sketched by Sir Nathaniel Dance. Haines was proprietor during many years in the latter half of the eighteenth century, when the house was No. 17, Great Russell-street, standing two doors eastwards from the Little Piazza, on the street's north side opposite "Button's,' which was established by Daniel Button in 1712. Thomas West, the first landlord of Tom's," committed suicide in November, 1722; the business continued until 1814. In a water-colour drawing (1857), by T. Hosmer Shepherd, it appears as Allen's Tea and Colonial Warehouse, and of late years the house has been

modernised for purposes of a Savings Bank.

Loan Collections at South Kensington.

During the hot weather the Victoria and Albert Museum is one of the coolest resorts in London, and it promises to be more agreeable still when it is less crowded and better arranged. Modern art education is too desultory, vague, and imperfect to develop real appreciation for all the variety of display at South Kensington. Without the discipline of study and a wide education, it is impossible to feel for the difficulties and appreciate the limitations imposed upon the masters of past centuries. From time to time we have pointed out and illustrated the good and bad points in various exhibits, to impress upon the student the value of thinking for himself when studying and sketching in the Museum. At the present time there is a valuable collection of goldsmiths' work and jewellery on exhibition, lent by Sir T. D. Gibson-Carmichael, M.P. Here and there is an individual piece of work of great refinement, expressive of the religious attitude of the day, not without many pieces of debased and vulgar work. The most important work in the collection is a gold shrine, probably of Flemish or Burgundian work of the fifteenth century. It enclosed an enamelled group consisting of a half-length figure of our Lord crowned with thorns, upheld by an angel with outspread wings. The doors of the shrine are decorated in translucent enamel with figures of the Virgin Mary and St. John the Evangelist; and on the outside with representations of St. John the Baptist and St. Catherine of Alexandria. The back is dotted engraved work showing the death and assumption of the Virgin. And on the top is a group of the coronation of the Virgin. The little cross-shaped receptacle at the top was evidently intended to contain a bit of the true cross; the brown leather case for containing this shrine accompanies it. On the right of this shrine is a gold pomander decorated with enamel, rubies, emeralds, and pearls; on the top a dog is formed, its body being a beautiful irregular pearl. This jewel was formerly in the possession of M. Spitzer. The same collector formerly possessed the two pendants, one a lion the other a dog, of carved ivory richly decorated with jewels. A very rare hat ornament, said to be made at Venice at the close of the fifteenth century, consisting of a group in high relief representing the Adoration of the Three Kings, should be compared with a similar but larger ornament lent by Mr. George Salting, and exhibited with other pieces of his magnificent collection on the other side of the South Court. There are other rare pieces of workmanship, all worthy of special remark. Mr. Salting has recently sent several additions to his collection, including a rare shaped ewer of enamelled earthenware, made at Gubbio at the beginning of the sixteenth century. Also two walnut panels, early sixteenth century, carved with angels beneath niches in low relief, of a distinct German character, but said to come from near Lyons. Mr. Salting has also acquired and lent the carpet which was the property of the late Lord Leighton.

Northfleet School Board Competition.

We commented in our last issue upon the unsatisfactory conditions in this competition. We have since received the following letter written by the Clerk to the Northfleet School Board in reply to a would-be competitor:—

Dear Sir,—In reply to your letter we have no printed particulars of the proposed school in the Dover-road. If you think seriously as to the competition, it will really be necessary for you to view the site and see me upon the matter. The Board desire, too, that the school should be upon the same principle as their present school in the High-street, Northfleet. Other instructions have also been given to me, but to express them in writing and make copies of them and a plan of the site for every applicant would necessarily entail much clerical labour. Any further information and assistance I can give you shall be readily given.—Yours faithfully, Fred. Mitchell.

Either the Northfleet School Board are very ignorant as to the usual procedure in architectural competitions, or they themselves do not think seriously of carrying this one to a conclusion, in which case it is strange they should have gone to the expense of an advertisement, to say nothing of trouble as to "clerical labour." The correspondent who sends us the above letter, writes, "Needless to say, I shall not compete"—a remark which all self-respecting architects will echo.

COMPETITION FOR KURSAAL, HARROGATE.

It passes comprehension how the Corporation of Harrogate can have expected to obtain a good stone-faced block of buildings, containing a concert-hall to seat 3,000 persons, refreshment-room and café, billiard-room for three or four tables, smoke-room, pump-room, reading-room, cloak-rooms, promenade corridors, and all the necessary rooms for musicians, &c., for 20,000*l*. Some of the competitors have attempted to reduce the cost by erecting a considerable part of the buildings of steel and glass, but this is directly counter to the instruction which runs, "All the buildings are to be faced with stone." Not one of the fourteen designs submitted can be carried out for 20,000*l*.

The assessor in a competition of this sort is placed in a difficult position. As it was distinctly stated in the instructions to architects that "competitors not complying strictly with the conditions will be disqualified," every competitor ought really to have been disqualified, as every design contravenes the condition as to cost. But such a Draconic decision would have been unsatisfactory alike to the assessor, the competitors, and the promoters of the competition. Two courses remained—the assessor might have ignored the impossible instruction altogether, and awarded premiums to the best designs irrespective of cost, or he might have selected those designs which can be carried out with the least excess over the sum named in the instructions. Mr. Frank Matcham, the assessor in this competition, appears to have leaned towards the latter course, and has awarded the first premium to the author of a design which, almost alone among all those submitted, retains all the trumpery glass and iron buildings which already exists along part of the front of the site. Of course, this is economical, but it is not architecture. At the right of the front is the existing concert-room, with its massive hexastyle Doric portico and pediment, and at the left the new stone-faced buildings, and between are the frippery iron and glass erections, positively refusing to harmonise either with the old or new stone structures. We cannot for a moment believe that the Corporation of Harrogate will be so overcome by economical considerations as to allow these incongruous erections to remain on the principal front of the building—a building, moreover, which has for neighbours in the same square the new Royal Baths, by Messrs. Baggallay & Bristowe, and the older Victoria Baths and Municipal Offices. This point ought to have been definitely decided by the Corporation before the instructions were issued to architects. As it happens, all the competitors who have attempted to design a building worthy of the town have by so doing minimised, if not altogether destroyed, their chances of success.

The site is a difficult one. It adjoins the existing concert-room and other buildings, and the greater part of it is now occupied by a shallow artificial lake, the concrete bottom of which is about 11 ft. below the floor of the old concert-room. Some of the competitors have boldly raised the floor of the new concert-hall to the level of the old, thus wasting the whole of the space beneath. Others have more wisely sunk the body of the new hall nearly to the level of the lake, but have kept the surrounding promenade at or near the level of the existing floors. Another difficulty to be overcome was the building line along the front; this is not a continuation of the front line of the existing buildings, but falls back from it at a very obtuse angle.

The first premium of 150*l*. has been awarded to Mr. R. J. Beale, Westminster, for a design more suitable for Blackpool or Yarmouth than for a fashionable watering-place like Harrogate. The general effect is cheap and tawdry, and the detail poor. The plans have some good points, but likewise some grave defects. The existing glass and iron buildings are retained, but converted into cloak-rooms and conveniences. The old concert-room is also retained, but the front part of it is walled off to form the new pump-room. The glass and iron lounge forming one side of the old concert-room is also retained, and from it a continuous flight of six steps leads down to the promenade around the new hall. The long axis of the new hall is parallel with the existing concert-room. The new hall measures 118 ft. by 105 ft. 6 in. and has a recess for the orchestra, measuring 60 ft. by 33 ft. 6 in. The shape of the hall is an oblong with splayed corners, and a promenade 20 ft. wide is carried entirely around it six steps below the level of the old concert-room. In the centre of the front, which, by the way, is set back behind the building line, but not parallel with it, the promenade is widened to form the entrance-hall by projecting a wide bay with canted sides. In the middle of this bay is the main entrance, and to right and left are the stairs to the gallery. Outside the left (north-west) promenade are placed the dining-room and billiard-room (for four tables); from the north canted promenade a semi-sedecagon is projected to form the café, and under this is the smoke-room. On the east canted side is a similar projection for the refreshment-room, and under it is the kitchen. From the promenade level ten tiers of seats lead down to the body of the hall. The side galleries have each three tiers, the top one being a passage; the front canted galleries have eight tiers, and the front central gallery ten tiers, with lounge in addition. The front stairs to the gallery are well arranged, although not wide enough.

Among the defects in the plans we may mention that boiler-room and coal stores are conspicuous by their absence; that the kitchen is at one end of the buildings, in the basement, and the dining-room at the other end on the ground floor; that the only pantry is hardly large enough for a cottage; that there is no external entrance to the kitchen, and stores must therefore be passed through a window or taken through the public promenade above; that there are no conveniences attached to the smoke-room; that there is no retiring-room for the chorus; that the space provided for the organ (4 ft. 6 in. from front to back) is too small; and that space for a chorus of only seventy is insufficient for a large hall like this.

Messrs. Eade & Johns, of Ipswich, have won the second premium of £100. Their design is in many respects more satisfactory than that placed first. It covers less ground, has a much better entrance, and replaces the iron and glass structures with buildings of a better architectural character. The new front is brought up to the building line, and the long axis of the hall is at right angles to this, and consequently not parallel with the old concert-room. The irregular space between the two is mainly given to the new promenade, which is about 20 ft. wide at the back, and 38 ft. wide at the front, where the main entrances are placed. A subsidiary entrance is placed on the central line of the hall, with cloak-rooms for ladies and gentlemen to left and right; each cloak-room has a flight of stairs leading to the conveniences below. The reading-room is at the extreme left of the front. The hall is an oblong with canted angles, and is entirely surrounded by a promenade about 19 ft. wide on three sides, and, as already explained, much wider on the fourth side. At the north angle of the promenade is the billiard-

room for only two tables, and there is a smoke-room under it in the basement. A second smoke-room is placed at the east angle with a refreshment-room under it. The principal refreshment-room is formed out of the back part of the old concert-room, adjoining the existing kitchen. The pump-room is rebuilt on the existing site. An important difference in this design is that the orchestra is placed at the front end of the hall, and consequently the rooms for band and chorus, which are under the orchestra, are without direct light, and the staircases down to the area of the hall have the same defect. The four staircases to the gallery are also bad, being narrow and winding.

As in the first premiated design, the central part of the hall is sunk nearly to the level of the lake, and around this are tiers of seats rising to the level of the promenade above. Under the uppermost tiers a corridor is cleverly arranged, communicating with the central area and with suitable exits. No provision is made for warming apparatus. The elevations remind one of an overgrown Board School of the central-hall type. The low-pitched gable of the hall forms the most important feature of the front elevation; it has a central portion decorated with pilasters, cornice and parapet with a central pediment. A semi-circular apse for the organ projects in the middle of the gable over the one-storied buildings below.

The third premiated design by Messrs. Crosby & Power, London, is a very clever piece of work, but occupies a great amount of space. The obtuse angle formed by the old and new building lines has been taken as the starting-point, and the line bisecting this angle forms the short axis of the hall, the long axis being at right angles. It will be seen, therefore, that the hall is placed across the site, and not lengthways. In many respects this is the best plan submitted. The entrance hall, or crush-room, is placed at the angle of the front, and forms a worthy approach to the hall. The greater part of it is 42 ft. wide, and a grand staircase, 14 ft. wide, leads down the centre of it to the area of the concert hall below. The entrance hall and main promenade encircling the concert hall are at the level of the old concert-room, and also at the level of the uppermost tier of the gallery of the new hall. The area of the new hall is level throughout, and the chairs are placed right across, so that a good view of the orchestra can be obtained from each. This is more than can be said for the first and second premiated designs, which show side tiers of seats, from many of which it would be impossible to see the orchestra except by turning one's head to an uncomfortable degree. This arrangement, however, necessitates the lowering of the area of the hall to a depth of 2 or 3 ft. below the bottom of the lake, and will interfere with a culvert which now crosses the site near the surface. The hall itself is a rough oval in shape, formed with twelve straight sides, and with a semi-circular apse for the orchestra at the north-west (or left) end. The billiard-room, smoke-room, reading-room, and gentleman's cloak-room, &c., are placed to the left of the entrance-hall, and the pump-room and ladies' cloak-room to the right. The old concert-room is retained, and the refreshment-rooms placed behind it on two floors; they are, therefore, a long way from the billiard and smoke-rooms. The artistes' rooms are well planned on the lower floor (level, *i.e.*, with the area of the hall), and rooms are provided for boilers, coal-stores, &c. A promenade is arranged around the greater part of the area of the hall in addition to the main promenade at the gallery level. About one-third of the lower promenade opens on to a terrace at the back or garden front of the buildings. The platform is too small, and no space is provided for an organ, and the elevations are of a somewhat coarse type of Renaissance, but notwithstandings these defects we have no hesitation in declaring this to be a better design than either of those placed before it. It would, however, probably prove more costly.

The three premiated designs, it will be noticed, are all of different types. The first has the new hall parallel with the old, and the front is set back, in order not to encroach beyond the new building line; the second accepts the new building line, and plans the new hall at right angles to this, the irregular space thus formed between the new and old halls being utilised for the promenade, &c.; the third adopts a central line between these two. Most of the competitors have adopted the first type of plan; there is only one design (besides Messrs. Eade & Johns') of the second type; and there are only two of the third type.

Design No. 1, by Mr. A. J. Meacher, of London, is of the second type, and shows a hall with two heights of galleries and a promenade only 10 ft. wide. It is more fitted for a theatre than a kursaal, and the elevations are insipid.

Mr. R. B. North, of London, in design No. 2, follows the third type of plan, but differs from the third premiated design in that the long axis of the hall is placed on the bisecting line of the plan, with the orchestra at the back or garden-front. The hall is narrower at the back than the front, the right side being parallel with the old hall, and therefore at right angles to the old building-line, and the left side being at right angles to the new building-line. A promenade 18 ft. wide runs around both area and gallery. As in the third premiated design, the main entrance-hall is placed at the angle of the front, but it is octagonal in shape, and is intended to be used also as the pump-room. The elevations are distinctly good. This is a good design, but costly, as the area of the concert hall is only three steps below the entrance hall and promenade.

Messrs. Ashley & Armstrong (design No. 3) are the only competitors who have submitted a thoroughly Classic design. They have entirely ignored the new building-line, and have thus put themselves out of court; this is unfortunate, as their plans and elevations are both meritorious. The gallery of the hall is badly planned; a panic in it would be disastrous.

Design No. 4, by Mr. J. Donkin, of Guildford, has some good points, but would be very costly. He boldly removes the Doric portico and replaces it with a rotunda of the same florid Renaissance character as the rest of his design. He shows two "grand staircases" up to the gallery, and has a promenade around three sides of the gallery (a good feature) as well as around the area of the hall.

Mr. W. J. Morley, of Bradford, submits a design (No. 5) in a style which may be described as a mixture of Flemish Renaissance and Moorish. At each angle of the hall there is a lofty octagonal tower or (shall we say?) minaret, apparently of brick and stone. The orchestra is badly placed in the gallery of the hall, and would, therefore, be invisible to a great part of the audience. The buildings would be very costly, as the floor of the body of the hall is raised to the level of the old concert-room, necessitating a vast amount of waste space below.

Design No. 6 is by Mr. G. E. Bolshaw, of Southport, and is of the first type of plan. It is a grandiose and costly design.

Mr. T. E. Marshall, of Harrogate (design No. 8) shows a horseshoe-shaped hall with the floor raised to the level of the old concert-room floor, and with the stage planned rather for theatrical than musical performances. The exterior is a sort of Byzantine with an effective entrance-group.

Mr. H. J. Bonner, of Lewisham, has adopted modern French Renaissance for his elevations (design No. 9), and replaces the Doric portico by a gable in keeping with the rest of his design. The principal front is one of the best submitted, and the plans also are of considerable merit. The design is not without defects, but it was worth a premium.

Messrs. Mangnall & Littlewood, of Manchester, have submitted two sets of drawings (Nos. 10 and 11), so nearly alike both in plan and elevation, as to be indistinguishable at the first glance. They are both costly.

Design No. 13 is by Messrs. J. A. Pole & A. C. Little, of London, and is well worth study. The concert hall is placed parallel with the old concert room, and the front is set back within the building-line. The new hall is a simple rectangle, 148 ft. by 115 ft., and the main floor is raised to the level of the floor of the existing buildings. As we have already pointed out, this is a costly feature on account of the nature of the site. The promenade on three sides of the hall is only 14 ft. wide. The stairs to the gallery are good, but it would have been much better to have formed the gallery over the area of the hall instead of over the promenades, and to have shown an upper promenade at the gallery level exactly over the lower one; by the arrangement adopted the width of the hall is increased in the gallery to about 145 ft. The smaller rooms are well arranged behind the existing buildings, with a separate entrance from the side street. The merits of this design are discounted by its costliness. The hall is too large, and it was a mistake to raise the whole of the floor to the level of the existing buildings.

It must be confessed that the competition can scarcely be regarded as successful. As architectural compositions the premiated designs are of little merit. The first premiated design leaves much to be desired, and the recommendation of the Committee that Mr. Matcham, the assessor, should be asked "to act as consulting architect with the architect whose plans shall be adopted," is in itself a confession that something better was expected.

THE BUILDING TRADE DISPUTE.

A PROVISIONAL settlement was made recently between the Yorkshire Federation of Master Builders and the London Order of Bricklayers. The employers have given way on the question of employment of non-unionists, while in regard to apprentices, the rule that no employer shall have more than are equal to one-fourth of the number of bricklayers he employs is to stand, but with the limitation that no employer shall have more than six apprentices. The men have also succeeded in obtaining a concession of ½d. per hour.

The second of the series of sectional conferences which have been arranged with a view to terminating local disputes in the Yorkshire building trade was held at the Queen's Hotel, Leeds, on the 9th inst., when representatives of the employers and of the Amalgamated Society of Carpenters and Joiners discussed the differences existing at Hull and Halifax, and formulated proposals for their adjustment. The Yorkshire Federation of Building Trade Employers was represented by Mr. W. Nicholson, who presided; Mr. Bray and Mr. Marsden, Hull; Mr. Charnock, Halifax; Mr. J. Umpleby, Leeds; and Mr. Dawson, Huddersfield. The case for the men was presented by Mr. W. T. Wilson, Bolton, chairman of Executive, and Mr. W. Chandler, Manchester, secretary of the Amalgamated Society; and Mr. Hall, Mr. Cuttle, and Mr. Gold, of Hull. In both Hull and Halifax the matter in dispute is one of wages, but questions as to rules were also discussed. The proceedings lasted over three hours, and the parties arrived at a virtual agreement as to the wages to be paid, but the terms offered by the masters were accompanied by the condition that the men should return to work with the imported non-unionists, and should also agree to certain minor alterations in the local rules. The question of working with non-unionists was the principal obstacle to a settlement. The men's delegates took up an uncompromising attitude, but the masters, in their turn, made a strong point of the contention that the various trade unions could not supply from their members sufficient workmen for the purposes of the employers, and that the importation of non-unionists was therefore a necessity. In the result the Federation made recommendations to both local associations with a view to bringing the disputes to a close.

At a meeting of the London Order of Bricklayers in Leeds, on the 12th inst., the conditions of settlement arranged by the Yorkshire Federation of Master Builders and representatives of the London Order of the Bricklayers' Society were agreed to with practical unanimity, and the men will resume work as soon as the arrangements can be made. The following are the terms of settlement:—

Rule 1.—Bricklaying wages to be advanced from 9d. to 9½d. per hour.

Rule 2.—That there be one apprentice to three bricklayers, and the limit be six. That they be legally bound for not less than five years, their age to be not more than sixteen years.

Rule 3.—That no builder be allowed to take an apprentice before he has been in business twelve months.

Rule 4.—The apprentice rule to be considered provisional till the national rules relating to apprentices have been settled.

Rule 5.—That no strike or lock-out shall take place under any circumstances without the matter in dispute having been first brought before the Standing Committee, which shall, however, meet to discuss the matter within forty-eight hours of notice being given to the Secretary, and the work in dispute shall remain in abeyance until such times as the Standing Committee have settled the matter. The Standing Committee to consist of seven employers and seven operatives.

On April 29 the London Order put in a claim for an increase of wages, at a conference with the master builders—a conference at which the Manchester Order of Bricklayers was also represented. The Manchester Order then stated that they did not want an advance, and therefore did not join in the application.

INFANT SCHOOL, WOMBWELL, YORKSHIRE.—On the 7th inst. the memorial stones were laid at Wombwell of a new infant department, which is to be added to the Sunday School connected with the Congregational body. The building will be of brick. Mr. A. B. Linford, of Wombwell, is the architect.

A WALK IN SARAGOSSA.

BY RAGNAR OSTBERG, "ARCHITECTE DES BÂTIMENTS PUBLICS," STOCKHOLM.

It was as I made my escape from hot and seductive Seville that I recollected that last summer, during my interesting study of architecture in England, I had agreed to send some Spanish sketches to the *Builder*.

I took my way straight from Seville to Saragossa, where I arrived late at night. The following morning, as I left the door of the Fonda de España with my sketch-book, I encountered a bitter blast of air. The *cierzo*, the cold west wind, had risen during the night, coming down from the snow-mountains of Castile, and sunny Saragossa was transformed into a winter city of my own north land. I turned back to wrap myself in a thick ulster and to stare at the mosquito-net round my bed, while the pictures my guide drew of Saragossa—"Wheat fields waving in full luxuriance, and nightingales piping among the willows on the river"—read mockingly enough.

After two days the cruel *cierzo* ceased, and then came summer; and on my morning walk—where I beg my English friends to accompany me—the sun beamed as hotly as in Seville.

Till we are out of the modern quarter, the *Calle de Independenza*—a wide, bare boulevard—and the *Plaza de la Constitucion*—the centre of all the life in the town—the more we shut our architectural eyes the better. Modern Spanish architecture has a desperate range, from exhausted French Garnier styles to the florid and vulgar *surchargé* of the German. It has nothing left of the living and fantastic but always well-balanced tradition of old Spanish buildings, except that in style it is all imported from abroad, and in this the Spaniards have always been consistent, taking their architecture from the four corners of the globe.

The architectural sins of our own time seem more screaming than usual in this old-fashioned town, and we are glad to escape into the *Calle de Don Jaime I.*, which the sun divides into two parts, one hot and deserted, the other chilly and crowded. We are faithful to the Spanish proverb, that dogs and foreigners walk in the sun, and soon we turn into a crooked lane, and stand before the façade of Casa de Laporta, a fascinating piece of Renaissance work. The portal, rich, almost overloaded, and the round iron balcony, are the only reliefs to the severe palace wall, where the windows are merely apertures in a fortress. When we open the small wooden door ("a door within a door," as in the colleges of Oxford and Cambridge), a cold, damp air strikes from the *Patio* or court, and it is easy to see how the old Spaniards succeeded in shutting out their worst enemy, heat. On a cold winter day they may have wished their success less perfect.

The columned *Patio* is richly decorated with stucco. On the west side the double staircase leads to an upper gallery; it has charming ornaments of plants and figures, and the court is crowned by a cupola of original form, in dark wood and steeped in the soft light that filters through the open arcades of the upper story.

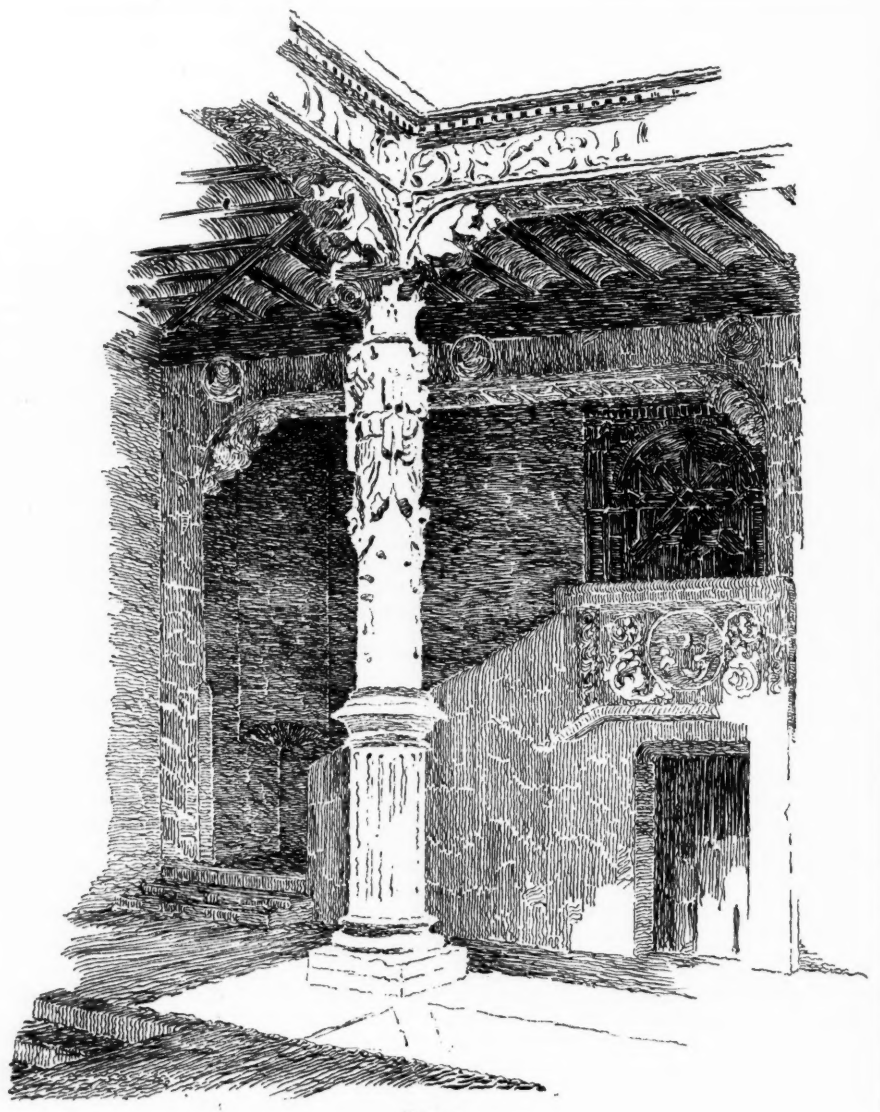


Fig. 2.

The entire interior, with all its abandoned splendour, with crumbling steps and carved capitals and groups of *amoretti* smothered in cobwebs, where falls no sound of living creature, might be the enchanted palace of the fairy-tale. In an obscure corner (fig. 2), opposite the grand staircase, is another and a very pictu resque little stair, leading to one of the old guardrooms. Its wooden door is richly carved in a Moorish design, the ornaments are white-washed, as well as the vaulted ceiling between the dark beams.

Just as I finished my sketch came the sleepy guard of the sleeping palace, to say, with a yawn, "Senor, it is forbidden to sketch here," but for half a *peseta* he went to sleep again, and with him the palace slumbered once more. A few steps further we pass under a dark gateway into another very small *Patio*, with an attractive iron balcony in its upper story. In

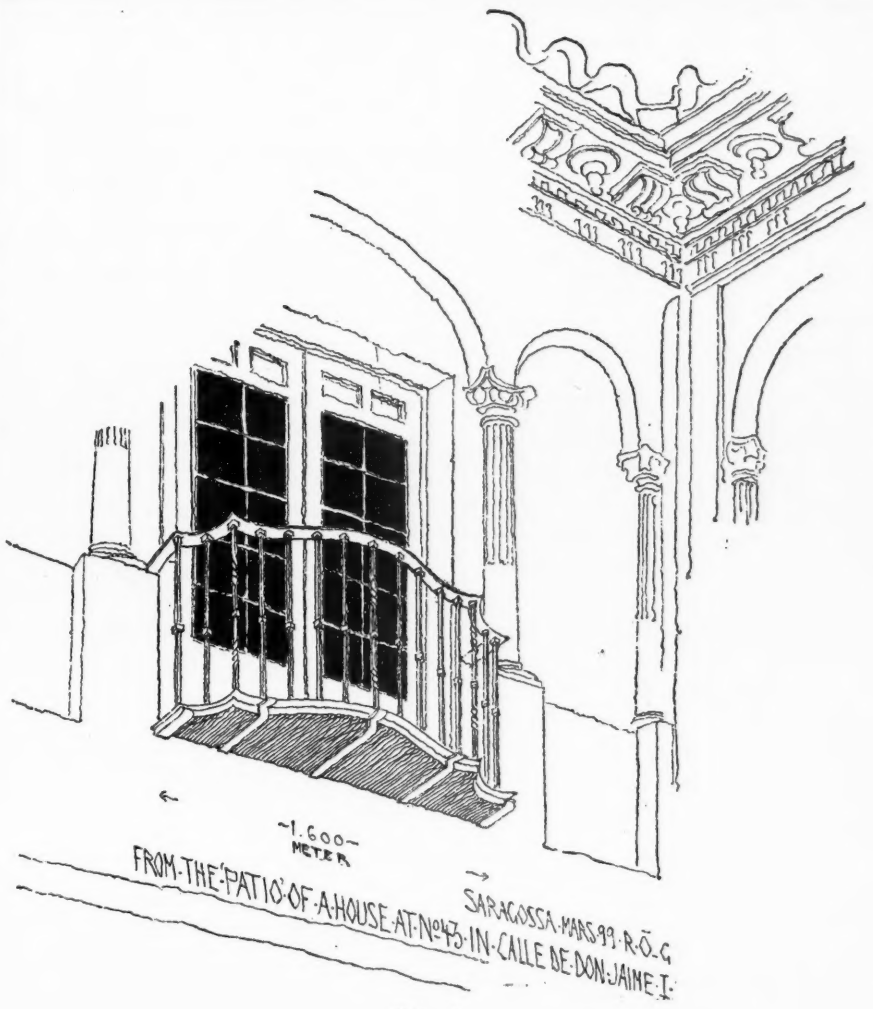


Fig. 3.

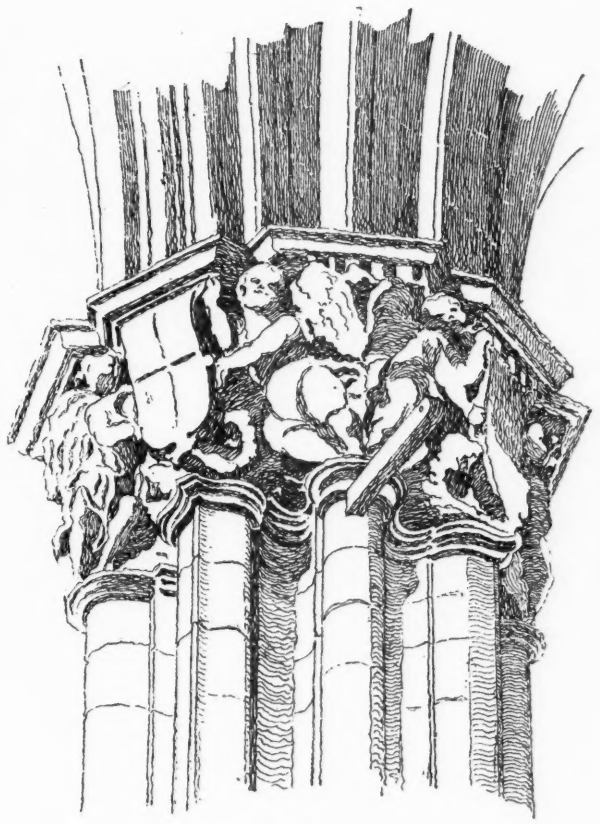


Fig. 4.

a country where the balconies play such a grand *rôle* in *les affaires d'amour* it is easy to understand the development they have reached and the tenderness with which they are adorned. Perhaps Seville offers the best and richest examples, but in nearly every street in Spain we meet with excellent specimens of the plainest yet most effective treatment of iron in this form. In the example sketched (Fig 3), by means of slightly varying the design, by placing the iron bars alternately straight and diagonally and by twisting the iron supports here and there, a good and distinguished effect is obtained without any protrusion in the section and without any additional ornamentation. Effort after effect by far-fetched means is so common in our modern composition of forms, that our eye rests with calm delight upon the very simple means here employed. In another narrow *calle, de la Torre Mueva* 23, the monotony of a long balcony is broken by an upright bar, which towards the upper part is bent to form an arch and crowned with a wrought-iron flower-bud; flower-pots are set close to it, and when the greenery twists round the iron arch, it forms a screen between two families sharing the same balcony.

Following the *Calle Don Jaime I.* towards the Ebro, we soon reach the great Cathedral of La Seo, built, as all good things are, through several centuries, from 1100 to 1500, on a spot where the principal mosque of the Moors of Saragossa once stood. Moorish influence is to be traced in many parts. The interior is full of singularly interesting details: not only do we trace the Moorish and Renaissance styles working hand in hand, we also perceive the intimate relationship between Spanish Gothic and Late English Gothic (as we do in other cathedrals in Spain). The rich and grandiose *cimborio*, adorned with figures, half-columns, and a dark blue frieze with gilded inscription, the ribs and gilt bosses of the groinings above, with the charmingly effective light, reminds me of one of the most attractive specimens of Late Gothic in England—I mean the cupola above the transept in Durham Cathedral. In the same way the interior of *La Seo* is plunged in a soft obscurity, clearing into glistening light around the transept and choir.

It is too dark to do more than a rapid sketch of one of the capitals of the pillars in the nave which are elaborately sculptured and uncommon in form (fig. 4).

In the interior of *La Seo*, and in many other Spanish cathedrals, more especially in Burgos, it is easy to trace those characteristic traits that are so attractive in English Gothic; the fine and sensitive combination of the Renaissance's feeling for horizontal proportions, and the upward-striving of the Gothic, calmed and modified.

The sharp sunlight dazzles our eyes as we come out of the dark, incense-filled church into the *Plaza de la Seo*, and we hurry into the shade afforded by the heavy and imposing façade of the Longa, an old exchange of the sixteenth century. Its chief interest is its hall, which reaches from floor to roof, and shows, beautifully carried out, the rare combination of Gothic vaulting based upon Ionic columns.

As we pass through the modern town hall to reach the ancient one, our eyes—and sketch-book—are caught by a large device on the gateway; the arms of the King of Arragon with the sign of the cross and the heads of four Moors. The design is from the rich and happy fifteenth century, that understood so well how to gift all it touched with poetry; stone not least of all (fig. 5). The relief of the leafy frame work is very vigorous, and the figures and shields within are less deeply moulded.

We turn from the town hall, crowded with Saragossa's poor—the impoverished, the deformed, and paralysed, and on the left we get an imposing view of the Ebro, with the stone bridge *Puente de Piedra*, more than five hundred years old, which connects the old town with the northern suburb of Arrabál. Our attention is arrested by the second cathedral of the town—the great pilgrim church, *Virgen del Pilar*. In colour and line it gives a strange fantastic and Oriental impression. A crowd of towers and cupolas grow up against the sky, the richly-coloured *azulejo* glistens in motley splendour on the domes. The long, low town along the Ebro stretches away into a flat line, broken only by a few church spires, and dies away in a blue haze, out of which the mountains of Castile and Navarre rise in the west. Right in front the compact and gloomy old bridge rears its seven arches, and its yellow-brown colour melts into the yellow-brown flood of the Ebro (see head-line sketch).

The interior of the church is disfigured by revolting restorations, baroque and roccoco in form and colour. The *Virgen del Pilar* is a beautiful fruit, with a worthless kernel—it is a shell which the well-advised will not try to penetrate. Following the newly-constructed promenade along the river, *Paseo del Ebro*, and passing through an old ruined gateway, we regain the town and find ourselves in the *Plaza del Mercado*, the centre of the oldest part. All the streets hereabouts, and the peculiar small, intricate *patios*, retain the ancient Aragonese style, and show what the town was like before the famous "Defence" which gained for Saragossa the proud title of *Siempre heróica*.

One of the many straight, narrow lanes, *Calle de San Blas*, leads to the little church of *San Paolo*. Its north portal (fig. 6) is remarkable for the fine sculpture of its figures

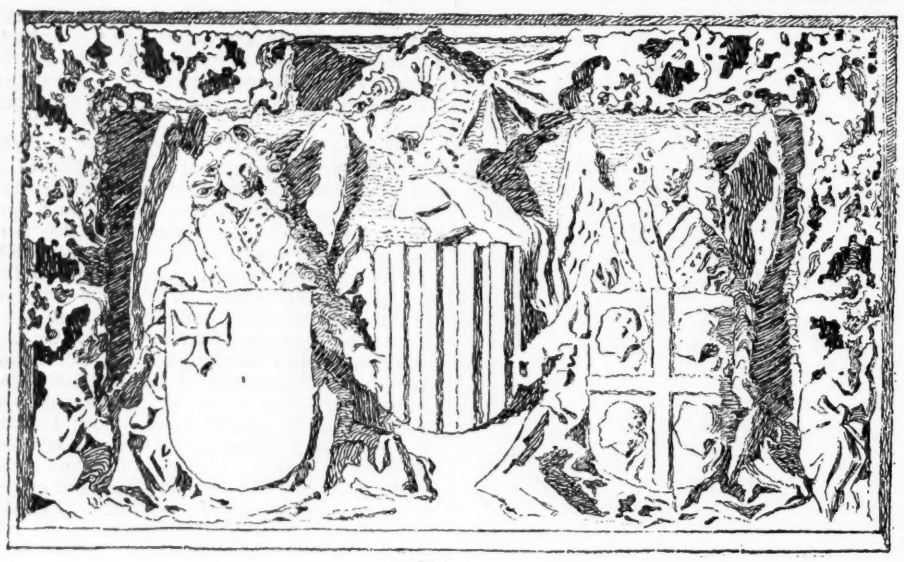


Fig. 5.

Fig. 6.

The façade is in brick, partly whitewashed The doors, which are 2.700 metres in width, are covered with metal plating, and the lintel and decorated space above are excellently carved in limestone. Above the low and very picturesque façade is a huge, richly-carved, wooden cornice (a common feature in Saragossa) which, with the dark, nearly black tones given by time, makes a fascinating contrast to the light-coloured wall. Looking at this pretty, graceful little façade, one hardly understands Fergusson's opinion, that San Paolo might pass for a church in the Crimea or on the steppes of Tartary. We realise his meaning better when we see the west front, with its slender tower going straight up from a small square, and when we enter the interior, where you go down twelve steps from the street and find all plunged in darkness, with only a few lamps giving a mysterious gleam.

The interior of *San Paolo* is one of the most singular in Spain, and merits a minute description; but I do not venture to exhaust the patience of my companions by dragging them down those twelve steps. I say good-bye, and am satisfied if, in return for the architectural information I have enjoyed in some of England's towns, I have been able to guide them a little way in Saragossa. R. O.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

At the meeting of the Building Act Committee of the London County Council on the 31st ult., being the day before the Council adjourned for the summer recess, the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the order of reference. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Building are new erections unless otherwise stated.

Lines of Frontage.

Clapham.—An addition at the rear of No. 253, Lavender-hill, Battersea, to abut upon Altenburg-gardens (Mr. W. C. Poole for Mr. E. Evans).—Consent.

Lewisham.—A brick and stone porch at the main entrance to the church school-room, on the south side of Torridon-road, Hither-green, Lewisham (Mr. L. Jacob for the London Congregational Union (south-east district).—Consent.

Norwood.—An entrance porch to a chapel proposed to be erected on the north side of Gipsy-road, West Norwood (Mr. H. W. Pratt for the Rev. W. Hobbs).—Consent.

St. George, Hanover-square.—An oriel window at the first-floor level in front of No. 50, Charles-street, Berkeley-square (Messrs. J. T. Wimperis & Arber for Mr. Mossop).—Consent.

Wandsworth.—That the application of Messrs. Gibbon & Moore for a further extension of the periods within which the erection of one-story shops upon part of the forecourts of Nos. 151 to 169 (odd numbers inclusive), Balham-high-road, was required to be commenced and completed, be granted.—Agreed.

Wandsworth.—Buildings on the site of Nos. 181, 183, 185, and 187, Streatham-high-road (Messrs. Brown & Barrow for Messrs. Pratt & Co.).—Consent.

Woolwich.—One-story bay windows and a porch in front of the "Barrack Tavern" public-house, Woolwich Common, Woolwich (Messrs. Dear & Winder for Mr. T. Bond).—Consent.

Strand.—That Messrs. F. Osbaldeston & Co. be informed that the Council is not prepared to accede to their request for consent to retain a structure at No. 3, Oxford-street, in advance of the general line of buildings in Charing Cross-road.—Agreed.

Brixton.—One-story shops in front of Nos. 5, 7, 9, 11, and 11a, Bedford-road, Clapham (Mr. J. J. Freeland for Mr. W. E. Brooks).—Refused.

Dulwich.—A building on the east side of Green-lane, Penge, at the corner of Parish-lane (Mr. F. E. L. Harris for the Penge and Beckenham Co-operative Society, Limited).—Refused.

Finsbury, Central.—A dwelling-house on the east side of Colney Hatch-lane, Muswell Hill (Mr. A. E. Parsons for Mr. J. Allen).—Refused.

Finsbury, East.—A station building on the site of Nos. 270, 272, and 274, City-road, St. Luke's (Mr. D. Hay for the City and South London Railway Company).—Refused.

Hackney, North.—Bay-windows and porches to residential flats on the south side of Mount Pleasant-lane, Upper Clapton-road, Clapton (Mr. J. Dickeson, jun.).—Refused.

Islington, North.—Two one-story shops upon the forecourt of No. 132, Seven Sisters-road, Holloway (Mr. J. Taft for Messrs. Rowe & Son).—Refused.

Kensington, South.—Two oriel windows, two and

three stories in height respectively, to an intended building at the corner of Yeoman's-row, and Egerton-gardens (Mr. W. H. Collbran).—Refused.

Paddington, South.—A wood, iron, and glass conservatory on the flat roof of the one-story portion of No. 38, Hyde Park Gardens, Paddington (Messrs. Maple & Co., Limited, for Mr. M. Gulbenkian).—Refused.

St. George, Hanover-square.—An oriel window above the portico at No. 33, Eccleston-street, Pimlico (Messrs. Sprake, Foreman & Son).—Refused.

St. George, Hanover-square.—An enclosed porch at the entrance to No. 14, Berkeley-square (Mr. W. G. Horseman for Mr. L. V. Harcourt).—Refused.

St. Pancras, South.—That Messrs. J. Simpson & Son be informed that the Council is not prepared to accede to their request for permission to retain a projecting sign-board attached to the front of Nos. 31 and 33, Whitfield-street, St. Pancras.—Agreed.

Projections from Buildings.

City of London.—Oriel windows on the second and third floors, in front of Nos. 55 and 56, St. Paul's-churchyard, City (Mr. E. C. Beaumont for Messrs. Jones & Co).—Consent.

City of London.—An iron and glass covered way in front of De Keyser's Royal Hotel, Victoria Embankment, City (Mr. E. A. Gruning for De Keyser's Royal Hotel Company, Limited).—Refused.

City of London.—An oriel window at the first and second floor levels in front of No. 24, Lime-street, City (Mr. B. Tabberer for Mr. A. G. Hubbuck).—Refused.

Width of Way.

Kennington.—An addition to No. 12, Albert Embankment, Lambeth, at less than the prescribed distance from the centre of Salamanca-street (Mr. J. A. J. Woodward for Mr. R. W. Cross).—Consent.

Whitechapel.—Water storage tanks, stokers' cabins, and conveniences on the east side of George-yard, Whitechapel, at less than the prescribed distance from the centre thereof (Mr. M. W. Jameson for the Board of Works for the Whitechapel district).—Consent.

Hackney, South.—An additional story on the existing one-story portion of Homerton College, High-street, Homerton, and the erection of water-closets to abut upon College-lane (Mr. T. J. Bailey for the School Board for London).—Refused.

Brixton.—A two-story warehouse on the north side of a footway leading from Camberwell-green to Camberwell New-road, Camberwell (Mr. A. E. Mullins for Mrs. S. Melhuish).—Refused.

Space at Rear.

St. George, Hanover-square.—A modification of the provisions of Section 41 (1) (vi.) of the London Building Act, 1894, with regard to open spaces about buildings, so far as relates to the proposed erection of a block of residential flats on the site of No. 25, Hanover-square, at the corner of George-street, St. George, Hanover-square, with an irregular space at the rear (Messrs. C. Bell, Withers & Meredith for Mr. G. H. Schofield).—Consent.

St. George, Hanover-square.—A modification of so much of the provisions of Part V. of the London Building Act, 1894, with regard to the extension above the diagonal line as directed to be drawn by Section 41 of that Act, so far as relates to the erection of an additional story on the top of No. 41, Park-lane, St. George, Hanover-square (Messrs. Marshall & Vickers for Sir Henry Meux, Bart.).—Consent.

Hammersmith.—That the Council in the exercise of its powers under Section 41 of the London Building Act, 1894, do not allow a modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of eleven shops, with basements under, on the east side of Fulham Palace-road, Hammersmith, with a factory building over and no open space at the rear exclusively belonging to such shops (Mr. H. W. Peck for Messrs. A. J. Jones & Co.).—Agreed.

Lines of Frontage and Width of Way.

Hackney, North.—Buildings upon part of the forecourt of No. 46, Northwold-road, Stoke Newington, at less than the prescribed distance from the centre of Bowling-green-street (Mr. G. H. Capper for Mr. A. C. Jackson).—Consent.

Marylebone, West.—Rebuilding of Nos. 1, 2, and 3, Cumberland-mews, Edgware-road, St. Marylebone (Mr. J. Hunt for the Rev. W. Carlile).—Consent.

Islington, South.—Station buildings on the site of Nos. 399, 401, and 403, City-road, at less than the prescribed distance from the centre of Torrens-street (Mr. D. Hay for the City and South London Railway Company).—Refused.

Line of Frontage and Construction of Building.

Dulwich.—That Messrs. McKenna & Co. be informed that the Council is not prepared to accede to their request for consent to retain at No. 47, East Dulwich-road, a structure erected beyond the general line of buildings in that street.—Agreed.

Width of Way and Temporary Building.

Whitechapel.—A wood and iron room in the garden adjoining Sir George's Residence for Working Girls, High-street, Whitechapel (Mr. F. Warman for Mr. E. H. Hodgkinson).—Refused.

Formation of Streets.

Hammersmith.—That Messrs. Northcroft, Son, & Neighbour be informed in reply to their application for permission to abandon the formation of Olaf-street, Latimer-road, Hammersmith, that the Council will not require the formation of such street to be carried out in accordance with the approved plan.—Agreed.

Southwark, West.—That an order be issued to Mr. C. C. Topham, sanctioning the formation or laying out of a new street for carriage traffic in continuation of Skin-market-place, to lead from Pond-yard to Emerson-street, Southwark (for the Board of Works for St. Saviour's District). That the name Skin-market-place (in continuation) be approved for the new street.—Agreed.

Woolwich.—That an order be issued to Mr. G. F. Logsdail, refusing to sanction the formation or laying out of twenty-six new streets for carriage traffic, on the Eltham Park estate, on the north side of High-street, Eltham (for Mr. A. Cameron Corbett, M.P.).—Agreed.

Artisans' Dwellings, Line of Frontage and Width of Way.

Camberwell, North. — That the application of Messrs. N. S. Joseph, Son, & Smithem for an extension of the periods within which the erection of two blocks of buildings on the south side of New Church-road, Camberwell, between No. 52 and Edmund-street, was required to be commenced and completed, be granted.—Agreed.

Cubical Extent.

Hoxton.—The erection on the west side of Clifton-street, Worship-street, Shoreditch, between Nos. 71 and 83, of a building to exceed in extent 250,000 cubic feet, and to be used only for the purposes of the trade of tea merchants (Mr. R. Willey for the Home and Colonial Stores, Limited).—Refused.

Means of Escape from the Top of High Buildings.

Strand.—That Mr. H. H. Collins be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth and sixth floors of a block of residential flats on the site of Cleveland House, No. 19, St. James's-square (for Messrs. Rolfe & Matthews).—Agreed.

Buildings on Low-lying Land.

Greenwich. — That the solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Mr. A. Roberts, for the erection of two dwelling-houses with shops on low-lying land known as plots 8 and 9, in Trafalgar-road, Greenwich (for Mr. G. W. Gordon).—Agreed.

Greenwich. — That the solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Mr. A. Roberts for the erection of two dwelling-houses with shops on low-lying land known as plots 10 and 11, in Trafalgar-road, Greenwich (for Mr. H. Bridel).—Agreed.

Greenwich.—That the solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Mr. A. Roberts, for the erection of a dwelling-house and shop on low-lying land known as Plot 12 in Trafalgar-road, Greenwich (for Mr. J. J. Faulkner).—Agreed.

Greenwich.—That the solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Mr. A. Roberts, for the erection of a dwelling-house with shop on low-lying land known at Plot 13 in Trafalgar-road, Greenwich (for the East Greenwich Mutual Benefit Building Society).—Agreed.

Woolwich.—That the solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Mr. T. J. Young, for the erection of three dwelling-houses on low-lying land, situated on the north side of Bostal-lane, Abbey Wood, Plumstead, eastward of the post-office (for Mr. W. Vobe).—Agreed.

HAM GREEN HOSPITAL, BRISTOL.

THE new hospital which has been erected on the Ham Green site, near Bristol, was opened recently. The plans for the new buildings, and for altering the old mansion so as to make it available for an administration building, were prepared in the office of the City Engineer (Mr. T. H. Yabbicom, M.Inst.C.E.). The works were commenced in 1896 by the workmen of the Corporation, with Mr. H. W. Harding as resident architect and engineer, and Mr. Woodlands as general foreman of the works.

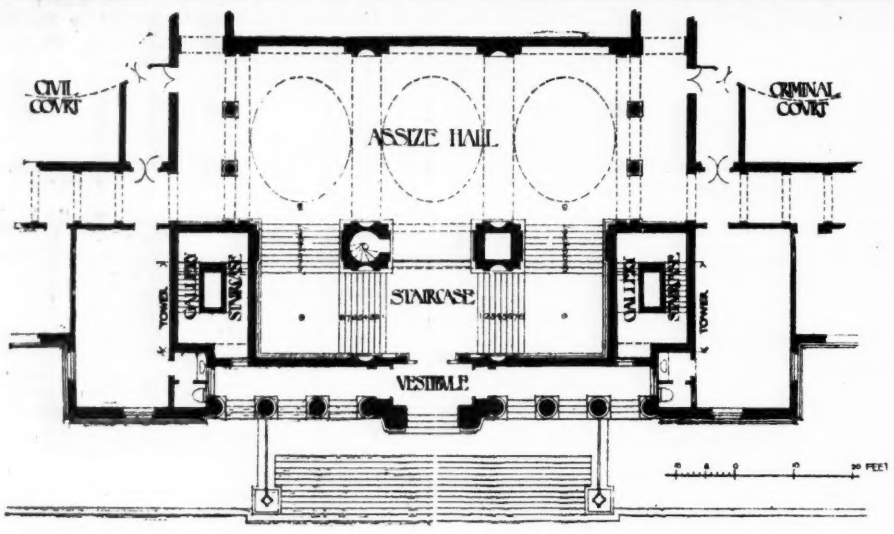
At the entrance to the hospital, on the right of the gateway, is the porter's lodge, which is built in Cattybrook red brick and half timber. The laundry buildings, situated near the lodge, are build in Cattybrook red brick with freestone dressings, and the whole is roofed in with Portmadoc slates. The boiler house contains two Cornish boilers 20 ft. long by 5 ft. diameter, to work at a pressure of 80 lbs. per square inch. The engine and dynamo house contain the generating plant for the electric light to the whole of the hospital buildings. The whole of the boilers in the laundry and the washing appliances have been supplied and fixed by Messrs. W. Williamson & Co., Hackney, London. At the end of the laundry block is the mortuary.

The mansion standing on the site has been altered and converted into an administration block for the accommodation of the medical officers, and the nursing and domestic staff. There are bath-rooms and water-closets on each floor; and the second floor also includes linen-room and house servants' bedrooms.

In the rear of the main block are the kitchens and stores, connected on the ground floor by a lobby. The accommodation provided is as follows: servants' hall, general store room, larder, pantry, dairy, and a washing-up room. The kitchen is provided with a cooking installation for 200 persons. Adjoining the kitchen is the cook's pantry. On the first floor are servants' bedrooms.

The four ward pavilions, for seventeen beds each, are designed in late Gothic style, and carried out in red Cattybrook brick with free-stone dressings. The high pitched roofs are boarded, felted, and covered with Port Madoc and permanent green slates laid in alternate bands. The pavilions are placed 60 ft. apart. Each contains two wards 48 ft. long, 26 ft. wide, and 14 ft. in height, to contain eight beds in each; one single bed ward, a nurse's room with small range, a bath room, and offices at the end of each ward, disconnected from the wards by a ventilated passage. In front of each ward is a 10 ft. wide verandah, with a west aspect, and running the entire length of the ward, affording facility for patients' beds to be moved out in the summer time. The verandah is of ornamental ironwork with glazed roof. The interior wall surfaces and ceilings are plastered in Keen's cement and painted. The floors are of polished pitch-pine blocks, laid in mastic on six inches of concrete. All corners and angles are rounded off to prevent any lodgment or accumulation of dust, the doors are constructed with flush panels, and the windows are constructed as plainly as possible with the same object. The walls are of best Cattybrook brick, with 9-in. exterior wall, 3-in. cavity, and 9-in. interior wall. Damp-proof courses of pure bitumen are inserted below the floor level in each wall, and concrete courses 6-in. thick, upon which the floors are laid, cover the whole site. The cubic space per ward is 17,472 cubic feet, and for each patient is 2,184 cubic feet. The floor space per ward is 1,248 square feet, and for each patient is 156 square feet. The window space, per cubic contents of ward, is about 1 ft. superficial to every 70 cubic feet. The windows are double-hung sliding sashes in the lower two-thirds, with a deep bottom rail to the lower sash, to allow of ventilation at centre rail on the Hinckes-Bird principle. The top windows fall inwards with glazed hopper sides. In addition to window ventilation, a sliding ventilator is placed beneath each bed leading from the open air, and two ceiling exhaust ventilators in each ward, with closing valve controlled from the ward, lead to Boyle's cowls on the ridge of the roof. Each ward is warmed by Shorland's ventilating double-fronted Manchester open firegrates, back to back in centre of ward; these admit warmed air to the ward, and the flues are carried beneath the floor to avoid the obstruction caused by direct flues. The wards and offices are lighted throughout by electricity generated on the premises. There are three pendants in each ward, with three lights on each, and lights suitably disposed in the smaller rooms and offices. The lighting is controlled from a switchboard in the central hall. The central hall, on to which the wards, nurse's-room, and bath-room open, is emphasised by a ventilating turret fitted with louvred glass side-lights controlled from below. Here also is placed a hot-water circulating boiler, from which hot water is conveyed to the bath-room, the lavatories, and the nurse's room. Two linen cupboards are placed here, with steam coils for keeping linen aired. The nurse's-room between the wards contains a small cooking range, white glazed porcelain sink, dresser, &c., and is fitted with observation windows controlling the wards. The drainage is constructed of glazed pipes, ventilated throughout, and each block is disconnected from the main drain. Inspection manholes are placed at each bend. Disconnexion manholes are provided to each ward. At the head of each block a Doulton's automatic flushing tank is constructed to discharge 200 gallons periodically. The water-closets are of the wash-down pedestal pattern, with 3-gallon flush tank. The slop-closets are Doulton's white earthenware rim flushing pedestal, with 3-gallon flush tanks, and taps fixed over each. The sanitary appliances are by Doulton and Twyford. Every soil-pipe is ventilated in full diameter, and carried to a disconnecting manhole. The main drain is carried to the Sewage Disposal Works, where the sewage is treated by precipitation and filtration, the effluent being discharged into the tidal Avon.

The offices at each extremity of the building contain lavatory basins, water closets and slop closet. They are disconnected from the wards by a ventilated air corridor, and the whole interior wall surface is lined with white glazed bricks, and furnished with cement floor for ready cleansing with the hose pipe. The bath room, entered from the central hall, has a discharge door into the



Entrance to Assize Courts, Cardiff. Plan.

entrance vestibule. The interior walls are lined with white glazed bricks, and there is space for two baths; and hot and cold water taps for each bath. The bath-room is provided with a fireplace. The vestibule is laid with tesselated pavement, and a small pantry is provided near the entrance door. Each pavilion is connected with the administration block by telephone.

The isolation pavilion for the reception of cases requiring separate isolation, consists of four wards arranged in pairs. One pair of wards, with nurse's room between, facing east; the other pair, with nurse's room between, facing west, being thus quite distinct from the first pair. Each ward and room opens directly into the open air under the verandah, and there is no direct communication between one room or ward and another. Each pair of wards is provided with separate water-closet, slop-sink, and bath-house for movable bath, in a detached block across the verandah. The wards are constructed for two patients in each, or eight in the entire block, allowing 2,000 cubic feet for each patient, and are warmed by open fireplaces. The general design and construction of these wards resembles that of the general wards.

The stables provide accommodation for eight horses and living rooms over for stableman.

The sewers have been laid on the separate system, storm water being kept entirely apart from sewage. The storm-water drains receive the water from the roofs and roads, and are constructed of 4 in. and 6 in. socketed glazed stoneware pipes, laid to a gradient of 1 in 50, and discharge direct into the River Avon. Each rain-water pipe discharges above the water seal of a properly trapped gully. On the north side of the site is laid the low level sewer, which receives the whole of the drainage from the four pavilions and isolation building. On the south side is the high-level sewer, which receives the drainage from the porter's lodge, laundry, administration building, and stables. These sewers connect up with the main outfall sewer at a point 380 ft. from the eastern boundary of the site. The outfall sewer is then carried across a meadow to the sewage works, which are situated near Chapel Pill. The length is 266 yards with an average fall of 1 in 60. The main sewers are constructed of 9 in. pipes, with manholes 6 ft. by 3 ft. placed 110 ft. apart. A 6 in. ventilating pipe is carried from the head of the sewer into the chimney-stack. This, in addition to the ventilating covers fixed on each manhole, provides ample ventilation. The drains from each building are intercepted from the main sewer by a 6-in. Winser trap. All the drains are laid in straight lines and at all changes of line or gradient is placed an inspection chamber built of white glazed bricks, with an iron air-tight cover for convenient access. Connexions to the drain are made in the manholes, and connected up with 4-in. Winser bends, which discharge into an open channel pipe, and thus allow the whole of the drain to be inspected and cleansed. At the extreme head of the main drain of each building is placed a flushing tank with a capacity of 200 gallons, and in it is fixed one of Doulton's automatic flushing siphons. A fresh air inlet is placed in the intercepting chamber, and the head of each branch drain is carried up above the roof by a 4-in. ventilating shaft, which, with the addition of a 2-in. anti-siphon pipe carried up from the back of the trap of each water-closet and slop-closet, provides ample ventilation to the whole of the system. The drains to each building are constructed of 4-in. and 6-in. glazed stoneware pipes jointed with Portland cement, and laid to a gradient of 1 in 30. The waste pipes from baths and lavatory basins are properly trapped immediately under the fitting, and discharge above the water seal of a trapped gulley situated outside the building.

Illustrations.

ENTRANCE TO ASSIZE COURTS, CARDIFF.

THIS drawing shows the central portion of the façade to the avenue which divides the Town Hall building and the Law Courts.

The large doorway is reserved for Judges' entrance and State occasions. The general public will enter through the side entrances under the colonnade.

The main heights, cornices, &c., range with those of the Town Hall. The architects are Messrs. Lanchester, Stewart, & Rickards.

ROYAL HOSPITAL FOR CONSUMPTION, BROMPTON, LONDON.

THIS illustration represents the south part of the ground and first-floor of the new home, for nurses, probationers and female servants, in course of erection facing Trafalgar-square, Chelsea.

The block is immediately to the south of the hospital proper, which consists of the old and original building on the north side of Fulham-road, and the new building on the south side erected from the designs of the late Mr. T. H. Wyatt.

The new home is connected to both blocks by a tunnel passing under York-mews and the Fulham-road. The building has floors of steel and concrete throughout, and there are three staircases of fire-resisting material, affording ample means of egress in the event of fire for the large numbers who will occupy the building.

The eastern wing of the building is for nurses who go out to attend private patients, and this wing (except for commissariat purposes) will be kept as a distinct establishment. The western wing is for night nurses, who are there shut out from all the working noise of the main building. The entrance floor is devoted to the various sitting, dining and writing rooms, offices, &c. The upper floors are all bedrooms, each nurse having a separate room. A hydraulic lift is provided for necessary service.

The bath-rooms, lavatories, and water-closets are in the necks connecting the wings to the main building. There is a basement, rendered necessary by former excavation, but this is only utilised for heating chambers, coal vaults, box-rooms, &c., the remainder being made available as a promenade for nurses in wet weather. The kitchens are detached.

Externally the building is faced with red brick, the bays and dressings being of Portland stone. The building is quite detached and will be surrounded by gardens.

The contractors are Messrs. Foster & Dicksee, of London and Rugby. The clerk of works is Mr. Chappell. The architect is Mr. Edwin T. Hall.

COUNTRY HOUSE AT FITTLEWORTH.

THE beautiful site selected for the building commands a most extensive view to the south and west over the Weald of Sussex, and is sheltered by dense wooding to the north and east. The house forms one of several which it is proposed ultimately to build on different outlying portions of the estate, and the picturesque style of the old Sussex farmhouse has been chosen, in obeyance to the architectural traditions of the district.

The materials are all of local origin and are those commonly employed in the neighbourhood. The walling is of rambling rubble work, the stone for which is quarried almost on the actual site. This stone quickly weathers to tints of yellow and grey-green, which harmonise well with dull purple-red brick quoins and dressings, and the orange-brown tiles with which the roofs are covered.

R. S. BALFOUR.

LYDDINGTON BEDE HOUSE.

LYDDINGTON is within pleasant walking distance of Gretton, that most charming of hill-side Northamptonshire villages, where every cottage and every farm-building cries aloud to be sketched. Lyddington, though over the border, and in Rutlandshire, lowlying in a luxuriance of foliage, is no less attractive, and its Bede House, owing to the earlier style of its architecture, is one of its most prominent buildings. The front illustrated overlooks the somewhat dark and gloomy churchyard, and brightens it with the deep glow of the golden browns of the ironstone walling and the silver-grey dressings of the stones in which it is built. The interior is not less interesting than the exterior, for it contains some exceptionally fine woodwork and old glass.

R. S. BALFOUR.

DESIGNS FOR FRIEZES, &c.

THE plate shows designs for friezes and for an upright panel, made by various artists (whose names are appended to their designs) for execution by Messrs. Hayward & Co.

Some of these designs, especially that by Mr. Paton Wilson, and the one under it by Mr. Pite, form good examples of what may be called a compromise between conventionalism and naturalism. In detail the floral forms approach much more closely to nature than we ever find them in ornament of the Classic school, but the general lines are arranged with sufficient conventionality to give them the quality proper to decorative design, which depends very largely on the flow of line; the angular breaks frequently found in natural foliage being quite out of keeping with the true ideal of ornament. This effort to keep closer to natural detail, while treating it in a decorative manner, is in fact one of the most marked characteristics of the modern school of decorative design in this country, and has led to a good deal of interesting work presenting a certain novelty of style.

The design by Mr. Clement Heaton is obviously intended for a stamped pattern of some kind, with a certain degree of relief; the others are designs for flat work.

TRADE CATALOGUES, &c.

THE Luxfer Prism Syndicate send an illustrated pamphlet on "Luxfer Prisms and Electro-Glazing Illustrated," a description and illustration of their manufacture, which has been fully described in our columns.

Messrs. Thomas Crapper & Co. (Chelsea) send an illustrated catalogue of sanitary appliances, among which we notice their patent disconnecting trap, the special feature of which is the provision of a gun-metal valve, with a galvanised iron chain pull secured at the top of the chamber, with the object of being able to empty the intercepting chamber in case of its becoming filled by any temporary stoppage in the trap. The catalogue includes channel pipes, frames and covers, sinks, traps, and all water-closet fittings.

The Davies' Karri and Jarrah Company send us a book containing views of their great timber-growing estate, and of the shops and other works connected with it. "Karridale," as it is called, appears to be quite a town, with not only a post and telegraph office, but a racecourse of its own. Some information as to the timber and the manner of working it is added.

Messrs. Holden Brooke (Manchester) send a pamphlet containing a statement of the advantages of their "Sirius" pulsating pump, with a price list for the various sizes.

Mr. J. P. White (Bedford) sends us a pamphlet catalogue containing illustrations of several garden seats made by him from the designs of Mr. Quennell. These are very good examples of simple and solidly made garden furniture with hardly anything that can be called ornament, in which the effect depends on the lines of the constructive portions; one or two of them we shall probably illustrate. The only question is whether comfort to the sitter is quite enough considered in some of them. The "Peacock" design looks very solid, and assorts well with the clipped hedge, but the straight seat and back do not invite repose. In one or two other designs, however, we observe that the seat rails take a concave line.

The Carron Company send us a sheet of new grates made by them, with fixed or movable canopies. There is a little too much cast ornament, but most of them look well, and there is a considerable variety in the designs.

Messrs. J. Beardshaw & Son (Sheffield) send us a catalogue of their steel tools—edge-tools, engineers' and contractors' tools, spades and shovels, augers, granite tools, &c.

Messrs. Hendry & Pattison (successors to D. O. Boyd) send us one catalogue including Boyd's grates, wrought-iron grilles, Kendall's patent reversible sash, &c., and another containing drawings of their wrought-iron casements and frames, which appear to be very good; wrought-iron door furniture, &c.

Messrs. Zadig & Co. send us a catalogue of railway contractors' plant, steel rails, tip-waggons of various kinds &c.; among which attention may be drawn to their waggons with screw brakes and driver's stand, for work on steep gradients, one of these brake waggons being sufficient to stop a train of six waggons. They also make side-tipping waggons, which have the advantage of always leaving the road free.

Messrs. Sagar & Co. (Halifax) send us a catalogue of their builders' and joiners' machines, for which they have gained a deserved celebrity; the present catalogue illustrates their circular saw benches, band-sawing machines, planing and thicknessing machines, tenoning machines, moulding machines, &c.

Messrs. Lumby (Halifax) send a descriptive and illustrated catalogue of their Pioneer boilers, for low-pressure hot-water heating.

Messrs. Bartle & Sons (Carn Brea, Cornwall) send a sheet of illustration and description of Skewes' patent combined moulding, planing, and sawing machine. They claim for it that it will plane boards up to 12 in. wide, and mould and plane skirtings up to 11 in. wide. At the end of the planer spindle are moulding blocks to receive knives for lighter mouldings, which are kept ready for use, the wood being adjusted to the knives by a parallel bar and thumb-screws. The frame is made of iron and steel, and represents four distinct machines, so constructed that neither part of the machine interferes with the working of the other.

Durran's Patent Syndicate send a sheet describing and illustrating the patent "Kallio" stable floor, for stalls and loose-boxes. The invention consists of a sunk pit, 6 in. deep, lined with asphalte or other impervious material; the bottom is laid to a slight fall to drain into a gully beneath. A specially made cast-iron frame is bedded down flush with the stable floor and filled in (between lugs) with reversible and interchangeable stout planks, 7 in. by 3 in. (edges chamfered), pickled in creosote. These planks are made to readily lift in and out, with a space, when fitted, of half an inch between each board, for quickly draining off the urine. The advantages claimed for a stable laid with these floors are that the quantity of straw used is considerably reduced, and the wood floor is drier and warmer for the horses to lie upon. It certainly appears worth attention.

Messrs. Wallach Bros. send a descriptive sheet of their "Evertrusty" Draught Indicator, for indicating the draught in boiler flues, ventilating shafts, &c.; architects will be most interested in the latter application, for it is often difficult to know how far ventilating shafts are actually doing the work they are supposed to do.

Mr. Robert D. Stewart sends a price list of paints, oils, varnishes, &c., also a long list of "sundries," useful in the painting department of building work.

Mr. Jas. Moir (Paisley) sends a description and illustration of his sanitary dust-bin, of galvanised iron and with a double lid, hinged at the centre. This seems an excellent sanitary article.

BOOKS RECEIVED.

A CATALOGUE OF THE SCULPTURED AND INSCRIBED STONES IN THE CATHEDRAL LIBRARY, DURHAM: the Roman series by F. J. Haverfield, M.A., F.S.A.; the Anglian series by W. Greenwell, M.A., F.S.A. (T. Caldcleugh, Durham.)

Correspondence.

To the Editor of THE BUILDER.

NEWCASTLE-UPON-TYNE ROYAL INFIRMARY COMPETITION.

SIR,—Without the least desire to carp at the decision in this competition, the question put at the end of the very reasonable criticism, in the *Builder* of the 12th inst., of the designs in this competition, viz., "Who shall decide when doctors disagree?" leads me to offer a few remarks in respect to hospital matters and their connexion with architectural competitions.

Some time ago I had a set of designs for school buildings disqualified for the trivial reason that the plan was tinted to distinguish the corridors from the rooms, the only intimation on that point being given in a letter received from the secretary a few days before the designs had to be sent in, and after my drawings were completed, simply stating, among other things, "No colour to be used." I referred the matter to the Royal Institute of British Architects, and received answer, "It is advisable in all cases to strictly adhere to instructions."

This may appear irrelevant, but it accounts for some of the adverse criticism upon my design for the Newcastle Royal Infirmary, in which every condition was strictly adhered to.

The conditions distinctly ask for four wards of twenty-two and two wards of twenty-four beds on the medical side. To secure the additional two beds, combined with the required classification, the slight projection at the corridor ends of two only of the ground floor wards was a simple, and certainly not an objectionable, means for complying with what was demanded; but, in the selected design, the requirement was ignored, because every large ward provides for twenty-four beds; the total being in excess of the 400 beds demanded; a liberty I did not dare to take in face of the advice of the Royal Institute of British Architects. There are other discrepancies, but I have no wish to appear to adversely criticise the plans, which are worthy of much commendation.

With regard to the out-patients' department, I followed the arrangement carried out at the General Hospital, Birmingham—an arrangement arrived at after careful consideration and visits, in company with members of the building committee and the medical and surgical staff, to all the principal hospitals having large out-patients' departments. After two years' working, the result is found to be perfectly satisfactory as regards convenience, avoidance of confusion and delay to both patients and staff; while as regards lighting and ventilation nothing better can be desired; moreover, the arrangement thoroughly suited the levels of ground at Newcastle, and utilised valuable space.

The external corridor was purposely not adopted either in the General Hospital, Birmingham, or in any design for Newcastle, simply because where provided it is found to be not only unnecessary, but absolutely misleading to patients and staff, most ludicrous mistakes being made in their efforts to grasp the intracacies of the arrangement. A recent visit to the newly-finished Bedford Infirmary proved this to be the case.

With regard to the Nurses' Home, the plans have evidently been misread by your reviewer, because windowed bays were provided for light and ventilation to the centre of the corridors in addition to end lighting. The small scale of the plans is probably accountable for this misunderstanding.

As to cost, my estimate was based upon the ascertained price per foot cube of my own and other recently-erected hospitals, and, I believe, fairly represents the probable outlay for the accommodation required, because, taking the estimates of three premiated designs, the total difference is only 20,000*l.*—not a large sum for rough estimates in so extensive a work—and the average of the three is actually within 24*l.* of my own estimate. The third, at 214,631*l.*, is further proof of extravagance in that design.

In respect to warming and ventilation, it is well known that I am a strong advocate of the "Plenum" system, which has proved so successful at Birmingham, but "from information received," I came to the conclusion that it had opponents in Newcastle, and the wording of the conditions, which demanded open fireplaces, led me to pocket my own convictions and to suggest a "tentative scheme."

Prejudice as regards warming and ventilation and on questions of planning is a stumbling-block to competitors for hospital work; the personal views of committees, whose experience is at times limited to buildings of antiquated type, are set forth; and the question for competitors is, are they strictly to follow the conditions of competition or not? The Royal Institute of British Architects says "Yes." The result of this and other recent competitions gives no reliable answer. I am of opinion that greater latitude should be allowed, believing that it would encourage advance in hospital planning.

Before long I hope to publish plans of the Royal Victoria Hospital, Belfast, which have been prepared in conjunction with my partner, Mr. Thomas Cooper, and have been approved by the committee and staff. They will indicate what a revolution in plan is possible with the "Plenum" system of ventilation, on lines I shadowed forth in a letter which appeared in the *Builder* of August 8, 1896.

WILLIAM HENMAN.

SANITARY INSPECTORS' EXAMINATION BOARD.

SIR,—The letter of the Secretary of the Sanitary Institute in to-day's issue of the *Builder* seems to call for notice. It is the fact that the newly incorporated Sanitary Inspectors' Examination Board do not propose to hold examinations in the provinces. Persons desirous of possessing the certificate of the Board will have to present themselves for examination in London. They will not be admitted to examination until after the specified courses of lectures and training shall have been completed. The certificate successful candidates will receive is the only legal instrument qualifying persons desirous of becoming sanitary inspectors in London. It is issued subject to the provisions of Section 108 (2) (*d*) of the Public Health (London) Act, 1891, and the provisions of the Memorandum and Articles of Association of the Board, which alone is recognised by the Local Government Board. At present no such qualifying certificate is required of candidates for the position of inspector of nuisances in the provinces, under the provisions of the Public Health Act, 1875, which does not apply to London. But it is hoped that the Local Government Board will, at an early date, require and secure evidence of qualification on the part of candidates by issuing an "order," or, if necessary, by promoting legislation. When this shall have been done, all persons desirous of becoming inspectors of nuisances will have to obtain the certificate of the new Board, as the Local Government Board do not intend to have more than one examining body, and persons who, after December 31, 1898, pass the examination of the Sanitary Institute in the provinces will not thereby be "qualified" for the office of inspector of nuisances—a fact which cannot be too widely known.

CAUTION.

August 12.

ALDERSHOT MASONIC HALL COMPETITION.

SIR,—This surely must be a "record" competition when you see fifteen sets of designs all adjudged to be of equal merit and only one plan worthy of a premium! A second premium was offered in the competition, and as the assessor has failed to make the award, the directors of the company would, I think, be quite justified in selecting for second place one of the fifteen designs to which they were most favourably disposed. The premium having been offered, it should most certainly be awarded.

COMPETITOR.

The Student's Column.

ROADS: THEIR CONSTRUCTION AND MAINTENANCE.

PART I.—MATERIALS (*Continued*).

8.—ARTIFICIAL STONE, BRICK, AND SLAG.

NO account of road-making materials would be complete without an examination of the nature and composition of the various kinds of artificial stone which are rapidly coming into use in the place of natural flagstones. Of the many varieties of artificial stone now in the market some are too expensive for use as paving material. Otherwise there is no reason why any of them should not be employed, as they are all made in moulds to any required shape, whereas the natural flagstones depend upon the fissile structure caused by their planes of bedding. On theoretical grounds it might appear that an artificial stone can be prepared, which, while combining all the good qualities of the best natural products, might at the same time be free from their defects; but, although great advances have been made in the production of artificial paving slabs, it is by no means easy to procure such a combination of desirable features as to excel the best examples which nature affords. In some respects artificial stone is superior: it is more homogeneous in texture and colour, and possesses greater freedom from local defects, such as concretionary and secretionary lumps. The better varieties, also, are not so absorptive and

are less liable to be influenced by changes of temperature, having no bedding planes to become loosened by frost.

In the manufacture of good artificial stone two main points have to be considered, viz., the nature of the hard material employed and the quality of the cement by which it is held together. In the selection of the hard material it is not enough to procure any material, or quarry refuse of whatever kind it may be. Bad stones liable to weather, or containing much pyrites or magnetite, which would speedily produce unsightly stains, should be avoided just as carefully as the natural rocks themselves. Amongst the materials which are employed, clean chippings or coarse grit made by crushing igneous crystalline rocks such as granite or syenite are the best; but good hard gravel, freestone chips, rubbish from refuse destructors, and even burnt clay ballast have been used. For artificial sandstone, clean, sharp quartz sand should be used, with but little iron, according to the colour desired.

Everything depends upon the cement. If this is of bad quality no amount of steeping in solutions will transform the stone into one of good quality. Portland cement varies considerably in its composition, owing to want of uniformity in the materials used in its preparation, such as chalk and clay, or river mud. The average composition of Portland cement and of the chalk and clay from which it is made may be taken as follows:—*

—	Cement.	Clay.	Chalk.
Silica	23·32	54·84	1·15
Alumina and Iron	12·13	25·08	0·78
Lime	61·56	0·90	54·0
Magnesia	1·07	0·80	0·25
Carbonic acid	1·28	0·83	42·5
Sulphuric acid	0·3	1·20	—
Organic matter, &c.	0·34	16·35	1·32

Besides the variability which must necessarily be found in the chemical composition of the materials, the process of manufacture is also responsible for many of the differences to be found in the quality of cements. The process of burning results in the reduction of chalk to quicklime, which reacts upon the clay, forming calcium silicate and calcium aluminate, of which two substances good cement is chiefly composed. Now this change only takes place at such a temperature that the mixture is in a state of semi-fusion called technically clinkering. Imperfect burning causes partial clinkering only and greatly diminishes the strength of the resulting cement. Another important point is the grinding. If the cement is not finely ground it will not undergo hydration simultaneously, the finer particles absorbing water more quickly than the coarser particles. Now if the finer particles have already set, the expansion caused by the subsequent setting of the larger particles tends to disturb and internally disintegrate the cement, whereby it is greatly weakened. The age of the cement also affects its setting properties. Fine-ground cement should be used quite fresh, for it gradually loses its setting power with age.

These few facts with respect to cement will be sufficient to show why great care should be exercised in its selection for the purpose of making artificial stone, some of the varieties of which we will now proceed to describe. It would not be possible to give details of every stone now in the market; we shall, therefore, select those which seem most suitable for illustrating the general principles which are involved in their manufacture.

As early as 1832 Ranger patented an artificial stone made of siliceous material in combination with brick or stone, using, as a matrix, Dorking or other limes in their pure state, mixing with boiling water and then forming into blocks. This process is of historical interest only.

Ten years later, Buckwell invented "granite breccia stone," using best Portland cement as a matrix, and oolitic or magnesian limestone fragments as an aggregate. The materials were mixed together with a small proportion of water only, and brought into close contact by an iron rammer.

Kuhlmann's Process.—About the year 1845, the use of soluble silicate was advocated by Kuhlmann. He prepared a solution of potassium silicate by dissolving flints in potassium hydrate solution at a high temperature. In this solution he soaked chalk or other porous stone, whereby the carbonate of lime in the stone was converted into silico-carbonate, the liberated carbonic acid combining with the potash to form potassium carbonate. In course of time, by the assistance of heat and dry air acting upon the stone, the silico-carbonate of lime was decomposed, silica being liberated, and the rock becoming hard enough on the surface to scratch glass.

Ransome's Process.—The above stone was only properly silicified on the surface. Ransome used the soluble silicate to convert clean sand into a compact mass, which he then immersed in a solution of calcium chloride, whereby calcium silicate was liberated in an insoluble state in the pores of the stone. The calcium silicate is very hard and adheres firmly to the particles of sand, resisting acid solutions, and producing a hard and compact sandstone. In 1870 he effected a great improvement in the above process by using Farnham stone, which contains about 40 per cent. of soluble silica, 15 per cent. of alumina, and the remainder of quartzose sand. When this stone is mixed with soluble silica, together with some chalk or clay, insoluble silicates of lime and alumina are formed, and the liberated soda, or potash, combines with the soluble silica of the Farnham stone to form fresh silicate, whereby a more compact rock is produced.

Victoria Stone.—This well-known paving stone was first introduced by Mr. Highton, who greatly reduced the size of the granite chips as previously used. These chips are almost pulverised before being mixed with Portland cement of the best quality and water. The resulting concrete is finally immersed in a solution of silicate of soda, which is prepared by boiling ground Farnham stone in caustic soda.

It is doubtful whether soaking such stone in silicate is of much benefit when hydraulic cement is used as the cementing material. The only use of soluble silicate is to form calcium silicate by double decomposition in the pores of the stone. To this end not only must the stone be in itself porous enough to absorb the solution freely, but it must also contain some calcium compound capable of reacting with sodium silicate; whereas in the best Portland cements the calcium is chiefly in the form of calcium silicate already.

Paving slabs are made either by hand or by machinery. The hand-made varieties are made in wooden moulds, lined inside with smooth sheet iron to ensure true shape and sharp edges. The top of the mould is open and the sides are removable so that the slab can be taken out without turning it over. The materials are mixed dry, in the proportion of three-parts pulverised granite, small enough to pass through a sieve. having a $\frac{3}{16}$-in. mesh, and one part best Portland cement. As little water as possible is added and the mixture transferred to the mould, where it is patted and trowelled until the top is in a sloppy condition. After a few days it is removed from the mould and placed in the air to mature for a period varying from six to twelve months. Some makers, before maturing the slabs, soak them for seven days or more either in water or in a solution of sodium silicate.

A great objection to hand-made slabs prepared in the above manner is the difficulty experienced in completely removing air bubbles, which not only leave hollow spaces in the stone when the concrete sets hard, but also give a spotty appearance to the finished stone. Its specific gravity and wearing properties are also affected by the presence of air cavities. Several methods are in vogue for the complete removal of air bubbles. Some makers attain this object by hammering the concrete well into the mould during the filling process. In other cases the mould is placed during filling on a trembling machine, whereby it is continually jumped up and down, so that the air bubbles rise to the top of the mass and disperse. The same object is attained in other cases by means of hydraulic pressure.

Instead of granite any hard, durable material may be used, as previously mentioned. Granite dust and cement as used in the above-described process give slabs of great compressive strength, reaching as high as 4,200 lbs. per square inch compression, and 650 lbs. tension. When made perfectly free from air cavities these slabs are characterised by perfect homogeneity, a surface which does not wear smooth, and affords good foothold whether wet or dry, and freedom from damage by frost, owing to the comparative non-porosity of the stone.

Stuart's granolithic paving slabs do not differ essentially from the above. Leicestershire granite is used and the slabs are soaked in soluble silicate solution.

The Imperial Stone Company use a mixture of Aberdeen, Guernsey, and Quenast stone, all fractural dust being carefully removed. The moulds are filled on a table jumped by mechanical means to remove air bubbles, and the stones are subsequently treated with silicate solution.

The Adamant Stone Company used Aberdeen granite chips and expelled air bubbles by hydraulic pressure of 10 cwt. per square inch.

Garstin's Granito-Plumbic paving differs from the above in the arrangement for securing a non-slippery surface. Clean granite siftings are mixed with the best Portland cement, and lead filings are introduced when being gauged. The wet mixture is well shaken up to remove air bubbles. The lead filings gravitate to the bottom, so that on turning out the slab they are almost all on the top, where they gradually become exposed during wear and maintain a good foothold on the surface. The same company have also proposed to render natural stone non-slippery by boring holes into the block and filling them up with lead.

Belgian artificial sandstone is made of very clean coarse quartz sand, mixed with one quarter of its weight of dry hydraulic lime. The mixture is compacted into moulds and heated in water for seventy-two hours in a boiler under a pressure of about 90 lbs. per square inch. On removal the blocks are still soft, but they rapidly harden in the air, and will finally withstand a pressure of 6,000 lbs. per square inch. They absorb only about 6 per cent. of water, and are quite unaffected by frost. A very similar stone is the Owen artificial sandstone, for which yellowish white quartz sand, sharp and free from all earthy impurities, is perfectly dried and automatically mixed with 12 per cent. of hydraulic lime in a rotary mixer. It is then placed in a mould, which is put into a strong cylinder, into which boiling water is admitted, and kept hot by steam-pipes inside the cylinder. It is thus kept under a pressure of 60 lb. per square inch for a period of two days, when it is withdrawn and matured. In the magnesite artificial stone, made in Berlin, very different effects are produced, according to the nature of the ingredients used. The process consists in adding to a solution of magnesium chloride a proper proportion of calcined magnesium carbonate (magnesite), or magnesia lime. To this are added various waste materials, such as sawdust, cork, peat, sand, stone waste, marble chippings, &c. The mixture is well kneaded and placed in moulds. When set, very hard and durable slabs are produced, and artificial sandstones and marbles are successfully imitated. The so-called Sorel stone is of this nature.

The above examples will be sufficient to explain the general character of artificial stone. A perfect imitation of natural sandstone with a siliceous cement has not yet been procured; but the calcium silicate cement secured in most of the above described processes very closely approximates in hardness and durability to the character of silica itself. In addition to the above-mentioned varieties, there are several kinds of stone, the mode of preparation of which has not been disclosed.

Brick.—The varying quality of English bricks and the resulting unevenness in their wear when used for pavements have greatly prejudiced the use of this material in this country. In Holland and in America bricks are very largely employed, and they have undoubtedly many advantages as paving material. Good bricks have a smooth but not a slippery surface, they are practically non-absorptive, and are, therefore, readily cleansed; while they also afford easy traction, and are suitable for gradients on which asphalt could not be used with safety.

A good paving brick should not absorb more than about 3 per cent. of moisture in twenty-four hours. It should also be tough enough to withstand the abrasion of heavy traffic. Both of these properties depend upon the degree of vitrification which burning produces. The more complete the vitrification the less absorptive will be the brick; but, on the other hand, a high degree of vitrification, by which the materials are more or less melted or fused, into a glassy mass, causes brittleness. Brittleness is also caused by improper annealing, owing to too rapid a rate of cooling, and by too

* Bamber, Proc. Inst. C.E., cvii., pp. 31-39.

large a proportion of sand in the clay from which it is made.

To avoid the above defects vitrification should in all cases just stop short of fusing. Now, the temperature at which a brick will fuse depends upon the composition of the clay from which it is manufactured. Clays with a very small proportion of fusible silicates, such as potash, soda, lime, or iron, are extremely refractory, and are hence known as fire-clays. Bricks of such clays would not vitrify, and would be useless for pavements on account of their porosity. On the other hand, too large a proportion of fusible silicates renders bricks liable to run; that is, they vitrify at too low a temperature and become brittle. Lime in excess is also an objection, owing to the formation of caustic lime on burning, which would speedily cause disintegration under the influence of moisture.

Again, uniformity of shape is an important point in paving bricks. Plastic clay, when used alone, is liable not only to lose its shape on burning, but also to crack on drying. The best bricks, therefore, are those made from loamy clays, or brick-earths, which contain not only a certain proportion of sand, but also just that amount of fusible silicate as will enable incipient vitrification to be reached without fusion.

Staffordshire blue bricks are those which are best adapted and most extensively used for pavements in this country. They are made from clay containing as much as 10 per cent. of iron oxide, and are burnt at a very high temperature, whereby the iron is reduced to protoxide, giving the characteristic dark blue or black colours. Dutch clinkers are small bricks used also for paving purposes. They are very hard, and burnt to complete vitrification, but are sometimes warped.

Various devices, such as grooves and chamfered edges, are employed for securing better foothold on brick pavements.

Slag.—The vitrified cinders from blast-furnaces, called by the general name of slag, are extensively used for the repair of roads in many of the iron-producing districts of Great Britain, and especially in parts of Yorkhire and Northamptonshire. Certain slags are also used in the manufacture of Portland cement. Consisting of fused silicates, the iron slags approximate very closely to the nature of igneous rocks. There is, however, one important difference. In igneous rocks the order of consolidation of the fused silicates is not always the inverse of their fusibility; but, as we have already seen in our description of the igneous rocks, rather in the order of their basicity. In such artificially fused substance as slag, the least fusible silicates are invariably the first to consolidate. Rapid cooling, also, produces an exceedingly glassy condition, and the consequence is that slags have the brittle characters of the more glassy igneous rocks. Slag is only suitable for macadam, and its quality is very variable, depending as it does upon the nature of the ore and the kind of flux used in the smelting process, as well as upon the temperature of the furnace. The following table shows the approximate composition of some typical slags:—

	Dowlais.	Cleveland.	South Staffordshire.
Silica	43	30	30
Alumina	15	22	15
Iron oxide	2·5	·3	2
Lime	29	39	32·5
Magnesia	5·8	6	3·4
Potash	1·3	—	1·0

We see, therefore, that for purposes of cement-making, slags contain a deficiency of lime; while, as road-stone, in comparison with igneous rocks there is not only a low silica percentage, but also a very high percentage of lime, calcium silicate largely preponderating in the place of the ferro-magnesian silicates so characteristic of the basic rocks.

Slags have but little binding property, and are, therefore, often used in conjunction with limestone, which not only aids consolidation, but also prevents the sharp edges of fresh laid slag from injuring horses' feet. The unequal wear of limestone and slag will, however, produce a rough surface.

GRAMMAR SCHOOL, BRIDLINGTON, YORKS.—The new grammar school buildings, on the north side of Bessingby-road, were opened on the 9th inst. The buildings were erected by Messrs. John Thompson & Son, of Peterborough, from the designs of Messrs. Botterill, Son, & Bilson, of Hull.

OBITUARY.

SIR EDWARD FRANKLAND.—We regret to record the death of Sir E. Frankland, so well known for his researches in connexion with the chemical examination of water used for drinking purposes. Born in 1825, he commenced his career as a student in the Museum of Practical Geology, Jermyn-street, under Dr. Lyon Playfair. He subsequently studied at the Universities of Marburg and Giessen, and on his return to England settled down to the investigation of certain promising branches of organic chemistry. In 1851 he was appointed Professor of Chemistry in the Owens College, Manchester, and was afterwards elected to the Chair of Chemistry at St. Bartholomew's hospital. In 1863 he was appointed Professor of Chemistry at the Royal Institution, but soon resigned to take up a similar post in the School of Mines, where he remained for twenty years, and where most of the work which rendered him famous was carried out. He was a prolific writer, especially on the practical applications of chemistry, and his book on "Water Analysis for Sanitary Purposes, with Hints for the Interpretation of Results," is one of the best practical manuals for the layman desiring to know what a water analysis actually means. His knowledge of the quality of the Metropolitan water supply was very extensive, and it was his duty as Government water analyst to make frequent reports on the subject. His views as to the interpretation of many of the results obtained, however, were not shared by many other scientists, thus he was occasionally involved in Academical controversies, especially in regard to the subject of "previous sewage contamination" of water. His researches on the bacteriological examination of water are of much use, as throwing light on another aspect of the water supply problem.

PROFESSOR BUNSEN.—The eminent chemist, Professor Robert William Bunsen, of Heidelberg, died on the 15th inst., aged eighty-eight. He was almost the last link between the modern and the older schools of chemistry, and as a demonstrator took rank with his famous contemporaries, Faraday and Tyndall. The greatest work of Bunsen's life was his investigation in conjunction with Kirchhoff, whereby spectrum analysis was placed on a sound and firm experimental basis. He discovered the alkali metals cæsium and rubidium; and the separation of the rarer earths always had a fascination for him. His researches on the chemistry of blast furnaces led to the discovery of accurate methods of gas analysis, whereby a great saving in the metallurgy of iron was effected. The electrical examination of metals was another subject on which he threw much light; and he invented the Bunsen battery, which has been so largely used in telegraphy. Laboratory apparatus also exercised much of his attention; amongst other things, he devised the gas burner bearing his name, which burner is now in almost universal use by physicists and chemists.

GENERAL BUILDING NEWS.

RESTORATION OF SAMLESBURY CHURCH, LANCASHIRE.—The Church of St. Leonard's-the-Less, Samlesbury, is being restored under the direction of Mr. James Bertwistle, architect, of Blackburn. The restoration consists of re-roofing the church, filling in the old oak skeleton panels with oak boards, building two new porches, and erecting a tower at the north-west corner of the north aisle. A peal of eight bells will be hung, made by Messrs. Taylors, of Loughborough. A three-dial clock, by Benson's, will also be placed in the tower. The oak work throughout is by Messrs. James Hatch & Sons, of Lancaster, the building contract having been let to Mr. John Knowles, of Darwen.

CATHOLIC CHURCH, MIDDLESBROUGH.—The foundation-stone has just been laid of the new Catholic Church of St. Patrick, Middlesbrough. The church will, when completed, accommodate about 700 people. The building will be 124 ft. 9 in. long by 60 ft., and will be built of brick with stone facings. The chancel will be 23 ft. 6 in. by 28 ft., and there will be two side altars, 12 ft. by 12 ft., and the nave, 94 ft. 6 in. and 28 ft. The aisles will be 94 ft. by 12 ft. Mr. E. Simpson, Bradford, is the architect, and the contractors are Messrs. Craggs & Benson, Stockton-on-Tees, whilst the stone work is being carried out by Messrs. Bowman & Sons, Stockton-on-Tees.

BAPTIST CHAPEL EXTENSION, PLYMOUTH.—The memorial stone has just been laid of a new Baptist chapel at Plymouth. Messrs. Wiblin & De Boinville, of Plymouth, are the architects, and Mr. J. Paynter, Plymouth, is the builder. The new chapel, which will have a frontage of 38 ft. 6 in. on the North-road, is Early Gothic in style. It will be built of brick, with stone dressings, and will seat 240 adults. The plans provide for one large central main entrance and one side entrance, both fronting on the main road. At the rear of the chapel will be two vestries, with lavatories and a back yard and entrance, and in the basement a boiler-house and store.

FREE CHURCH, GOVAN, N.B.—This church is now being built on George-drive, Govan, under the Glasgow Free Church Extension Scheme. The church will have a gallery on three sides. Its length is 74 ft., and its width 51 ft. The main front faces George-drive, and is flanked by two towers finished with open cupolas. The main entrance to the church is in the centre of the north front. The building will accommodate over 1,000 persons. Adjoining the church is a meeting-hall which will accommodate over 300 persons, while the Session house is placed at one end of the hall, so that the two apartments can be thrown into one when desired. Over the session house and vestry a house of two rooms and kitchen is provided for the church officer. Internally, the ceiling will be of panelled plaster, and the woodwork of seating will be yellow pine. The buildings will be of red stone, and the total cost will be about 6,000*l.* The architect is Mr. James Miller, Glasgow.

CHURCH, STANTON HILL, SKEGBY, NOTTS.—The foundation stone of a new church for the Stanton Hill portion of the Skegby parish was laid recently. The church, which will be Early English in style, is estimated to cost, with furnishing, a sum of 1,400*l.*, Mr. P. H. Currey, of Derby, being the architect, and Mr. R. Wilson, of Skegby, the builder.

CULLEN FREE CHURCH, N.B.—The foundation-stone of the new Cullen Free church has just been laid. The old church will be directly connected with the new church, and it will be divided into halls and rooms. The new church will be of the Gothic style and will be surmounted by a tower and spire about 100 ft. high. It will cost about 2,300*l.*, and the sittings will number 454. The architect is Mr. Macmillan, Aberdeen.

RENOVATION OF THE FREE CHURCH, CAIRNIE, N.B.—Cairnie Free Church has just undergone a process of renovation, which consisted of alterations to the seating, the renewal in certain places of the flooring and joists, painting of the walls, and the staining and varnishing of the woodwork. The architect was Mr. Thomson, of Fife-Keith. Mr. Christie, Cairnie, executed the carpentry work, and Mr. Symon, Keith, the painting and glazing.

A NEW WESLEYAN CHURCH FOR WOLVERHAMPTON.—A new Wesleyan church is to be shortly erected in Darlington-street, Wolverhampton, at a cost of 10,500*l.* The plans have been prepared by Mr. Arthur Marshall, of Nottingham.

TECHNICAL SCHOOLS, DURHAM.—The foundation-stone of the Johnston Technical Schools was laid on the 1st inst. The new buildings occupy a site in South-street, which slopes rapidly down to the river. Accommodation is provided for science and art teaching, cookery classes, &c. The building is three stories in height. In the lower floor are the physical laboratory, cookery and science class-rooms, and lavatory, dark room, and heating chamber. The ground floor is for science teaching, with large chemical laboratory, lecture-room, preparation room, secretary's room, and science class-room, with hat and cloak accommodation, store-room, and balance-room. The upper floor is devoted to elementary and advanced art teaching, painting, modelling, and drawing from the antique. Externally the building will be carried out with red bricks, with deep red brick strings and arches, and red tiled roofs. The upper parts of the walls are rough cast, and on the west front, facing South-street, are a succession of five large slightly projecting oriel windows, lighting the various class-rooms. The contract has been let to Messrs. George Gradon & Son, of Durham, and the work is now proceeding from the designs and under the superintendence of Messrs. Oliver & Leeson, architects, Newcastle-upon-Tyne.

BOARD SCHOOL, BEDFORD.—New Board schools are being erected in Goldington-road, Bedford. The architect is Mr. H. Young.

BOARD SCHOOL, CHESTERFIELD.—The Chesterfield School Board propose to erect a central school on a site at the junction of Foljambe and Ashgate-roads. The architect is Mr. W. Cecil Jackson.

NEW BOARD SCHOOL, BANNOCKBURN.—The School Board of the parish of St. Ninians opened a new school at Bannockburn on the 10th inst. The school has been erected at a cost of 3,400*l.*, and has accommodation for 368 scholars. Mr. Ronald Walker was the architect.

HOSPITAL, DOUGLAS.—A new small-pox hospital is to be erected at Douglas, in place of the old corrugated iron structure. The plans have been prepared by Mr. A. E. Prescott, the Borough Surveyor. Mr. F. Callow is the contractor, and Messrs. Carine & Skelley are the sub-contractors for masonry and brickwork.

NEW WING, TIVERTON INFIRMARY, DEVONSHIRE.—The new wing of the Tiverton Infirmary, erected as a commemoration of the Queen's Diamond Jubilee, was opened on the 10th inst. The wing, which is for paying patients only, has been built at a cost of about 1,550*l.*, by Messrs. Deering & Son, from plans by Mr. J. Siddall.

BANK, STRATFORD-ON-AVON.—New banking premises for Lloyds, Limited, have been erected at the corner of Bridge-street and Union-street, at a cost of about 6,000*l.* Messrs. J. A. Chatwin & Sons, of Birmingham, were the architects; and Messrs. Collins & Godfrey, of Tewkesbury, the builders.

WESLEYAN METHODIST SUNDAY SCHOOL, HEPWORTH.—The memorial stones of a new Wesleyan Sunday School were laid at Hepworth on the 5th inst. Mr. Joseph Smith, of Holmfirth and Sheffield, is the architect. The contractors are:—Masons, Messrs. Hollingworth & Son, Cumberworth; joiner, Mr. Henry Noble, Yew Tree, Shepley; plumber, Mr. Ed. Thorp, Holmfirth; plasterers, Messrs. Haigh Bros., Holmfirth; painters, Messrs. Lawton &

Hogley, Holmfirth; and slaters, Messrs. Pickles Bros., Huddersfield.

Royal Court Theatre, Wigan.—This theatre, which has been re-modelled, was re-opened on Bank Holiday, August 7. The entire auditorium has been gutted and reconstructed. The dress and family circles are entered from the front, in King-street. The two tiers, which are arranged with dress circle, four private boxes, family circle, upper circle, amphitheatre, and gallery, are supported by iron columns; and every occupant of a seat in any part of the house has an uninterrupted view of the stage. The ground floor is fitted up with new stalls, and present pit. The foyer, dress circle, and bar saloons are suitably decorated and appointed. The stage has large scene-docks, property-rooms, property-makers' stores, and paint-room. The block of dressing-rooms is at the side and detached from the stage. A complete installation of electric light has been erected. The decorations of the theatre have been carried out in French Renaissance. The prevailing tints are cream, buff, and gold, relieved by rose-pink and smoky-blues. The centre portion of the ceiling is domed and divided out with open scrolls, worked with bold cornices and enrichments. The proscenium opening is flanked on each side with an enriched frame. There are two private boxes on each side of the stage. The gallery and dress circle fronts are decorated in gold and colours. The electric light has been introduced into the circle fronts so as to form part of the scheme of the decoration. The walls of the auditorium are covered with Japanese paper. The whole of the work has been carried out under the personal supervision of the architect, Mr. J. P. Briggs, of London, assisted by Mr. S. King Sheldon and Mr. H. J. Worswick. The joinery work has been done by Messrs. Lomax Bros., Platt Bridge; the foyer and saloons, seating, upholstering, fibrous plaster, draperies, and general decoration of the auditorium and saloons have been carried out by Messrs. A. R. Dean, Limited, of Birmingham; electric light installation by the Corlett Electrical Engineering Company, Wigan; the grand entrance and general painting by Messrs. Lea & Sons, Wigan; the new drop curtain and draperies have been painted by Mr. George Whyatt, jun., London.

New Block, Royal National Hospital for Consumption and Diseases of the Chest, Ventnor, Isle of Wight.—A new block (the eleventh) at this hospital was opened on the 9th inst. It is named "The Battenberg" block, and has been built of local stone, with freestone dressings. It has been designed generally to harmonise with the existing buildings. It consists of three houses, accommodating twenty-one patients, allowing a separate south sleeping chamber for every patient, and a separate south sitting-room for every seven patients. The size of the bed-rooms is 14 ft. by 11 ft. 6 in., and the size of the sitting-rooms is as follows, viz., one 24 ft. 8 in. by 23 ft., and the other two 24 ft. 8 in. by 18 ft. 9 in. In addition to these rooms for patients, there is complete accommodation for the requisite staff of nurses, with sitting and bed rooms, kitchen, and offices arranged on the north of the block. The floors and staircases are of teak throughout, and the walls rendered in Parian cement. The angles of all walls, floors, and ceilings are rounded to prevent dust lodgment. The outer hall and vestibule is suitably tiled. Verandahs and balconies of cast-iron and steel construction, with asphalt floors, are provided on each floor facing south. These are sufficiently wide (11 ft.) to admit of beds being wheeled through the French casements when required for patients in some stages of the disease, and also for the proper carrying-out of the "open-air treatment." The rooms and passages are warmed to a regulated temperature by specially-designed heating apparatus through which the external air is admitted by means of gratings in the outer walls and made to pass over steam-heated radiators. The block has been wired and fitted throughout for electric light, and electric bells to each patient's bedroom are provided. Mr. Theodore R. Saunders, of Ventnor, was the architect; Mr. Albert Sims was the contractor The plumbing and sanitary work was carried out by Messrs. B. Finch & Co., London; the heating and ventilation by Messrs. Rosser & Russell, London; the cast-iron verandah and balconies by Messrs. W. Macfarlane & Co., Glasgow; the wiring and fitting for electric light, bells, and fire-alarms by Messrs. W. J. Fryer & Co., London; the tile and mosaic work by Messrs. W. B. Simpson & Sons (Maw & Co.), London; the asphalt to balconies by the Limmer Asphalt Paving Co., Limited, London; the floors of the verandah, lavatory, &c., by Rust's Vitreous Mosaic Co., London.

New Drill Hall at Gateshead. — The foundation-stone of the new drill hall in Liddell-terrace, Gateshead, for the second Battery of the 1st Newcastle Artillery, has just been laid. The hall is 80 ft. long by 47 ft. 6 in. wide, with the main entrance from Liddell-terrace in the centre. At one end of the hall are officers' quarters, with private entrance from the front street; orderly office, clothing store, armoury and harness room, with archway leading to parade-ground. Above these, on the first floor, are the caretaker's quarters, and gallery the full width of the hall. At the other end of the hall are the sergeants' mess, gunners' mess, lavatories, and small yard. The building is of red brick with stone dressings. The contractor is Mr. E. T. George, of Newcastle, and the architects are Messrs. Watson & Curry, Newcastle.

Library, Norwich.—The Norfolk and Norwich Library, which was destroyed by fire about a year ago, was opened after reconstruction, on the 2nd inst. Messrs. Boardman & Son, of Norwich, were the architects.

New Empire Theatre, New Cross.—The New Cross Empire Theatre of Varieties, situated at the corner of New Cross-road and Watson-street, has just been opened. It has been erected from the designs of Mr. Frank Matcham, architect, by Messrs. Godson & Sons, of Kilburn. The material used on the main front is red Leicester brick, with brown-coloured cement dressings. The building will seat about 3,000 people. On the ground floor there are about 350 stalls and a pit, containing ten rows of seats. There are three tiers—the grand circle, having six rows of seats, with boxes at the sides and rear, and promenades; the upper circle, containing five rows of seats; and the gallery, holding ten rows. This gallery is not carried around the house in the usual manner. The house having been built on the cantilever principle, there are no pillars to obstruct the view of the stage, which is situated at the side, and not the end, of the house, and is 40 ft. by 36 ft. The entrance vestibule has a double staircase of white marble, with the pay offices set between under a minaret. Over the entrance doors inside there is a balcony. Electric light, installed by Messrs. Blackburn & Starling, lights the auditorium. The decorative work is by Messrs. Warings, Limited, in the Louis XIV. period, the prevailing tints employed being bronze, gold, pale blue, and cream.

Almshouses, Lyme Regis.—The corner-stone has just been laid of the new Marder Almshouses. The architect is Mr. W. J. Fletcher, of Wimborne, and Messrs. W. Caddy & Sons, of Lyme, are the builders.

Library, Bristol.—A new library is to be erected in the Cheltenham-road, North Bristol. The site cost 2,575*l.*, and the building contract has been let to Messrs. Wilkins & Son for 7,439*l.* Mr. W. V. Gough is the architect.

Drill Hall at West Bromwich.—The foundation-stone of a new drill hall at Carter's-green, West Bromwich, was laid recently. Messrs. Wood & Kendrick are the architects.

Baths, Brightside, Sheffield. — The new Corporation Baths at Brightside were opened on the 31st ult. The building consists of a men's swimming-bath 75 ft. by 30 ft., two foot-baths, thirty-two dressing-boxes, and ten ladies' slipper-baths. Separate entrances and waiting-halls are provided, and in the basement is a laundry. It is proposed to extend the building, at some future time, when a ladies' swimming-bath and eleven slipper-baths will be added. The work was carried out by Messrs. Webster, from plans by Mr. C. F. Wike, the City Surveyor. Messrs. Moorwood, Sons, & Co. were the contractors for the heating apparatus and laundry-work.

Hotel, Cupar, Fife.—Alterations and additions have been carried out at the Royal Hotel, Cupar. Mr. William Birrell, of Cupar and Kirkcaldy, was the architect, and the following were the contractors:—Mason work, Messrs. Stark & Webster, Cupar Muir; joiner work, Mr. A. Smith, Cupar; plumber, Mr. D. Brown, Dundee; slater and plasterer, Mr. F. Batchelor, Cupar; tiling, Messrs. J. & H. Potts, Edinburgh; bell-hangers, Messrs. A. Westwood & Son, Dundee; glazier, Mr. Charles Edmond, Cupar.

Public Offices, King's Norton, Warwickshire.—A Local Government Board inquiry was held on the 10th inst., at the King's Heath Institute, into an application by the King's Norton and Northfield Urban District Council for permission to borrow 1,150*l.* for the purchase of land in the Pershore-road, King's Norton, as a site for public offices, fire-station and depôt. The inquiry was conducted by Mr. H. H. Law. Mr. A. W. Cross, Surveyor to the District Council, gave evidence in support of the application.

SANITARY AND ENGINEERING NEWS.

Sewage Treatment, Southwold.—Mr. Fredk. Ball, Borough Surveyor, reports that, in consequence of the sewage work, at the time of his accession to the office of Borough Surveyor, being inadequate, Mr. Candy, of the International Purification Syndicate was instructed to submit a scheme for the bacterial treatment of the sewage upon the polarite oxydising system, in order to test which it was decided to utilise one of the three existing precipitation tanks. The tank was divided into two compartments to form an anaerobic sludge digesting bed and anaerobic or polarite oxidising bed. Crude sewage is admitted to the detritus chamber, wherein the grit is deposited, and paper and floating solids are arrested, until sufficiently disintegrated to be carried into the anaerobic bed through slotted wooden troughs laid below the surface of the anaerobic bed, being thus evenly distributed This bed consists of large cobble stones from the beach, laid to a depth of about 4 ft. On the top of the cobbles the slotted wooden troughs are laid, and the whole covered over with gravel, so that anærobic conditions are obtained. The liquid sewage passes equally downwards through the bed and is collected into a brick channel with iron outlet pipes fixed in the top and rising above the level of the inlet troughs, but not up to the level of the top fine gravel. These pipes discharge into an open trough, which feeds the self-propelled revolving sprinklers and aërators (Candy's patent) that deliver the anaerobic effluent on to the rapid oxidising polarite bed, which effects the final purification by oxidising the soluble impurities and nitrifying the ammonia. The quantity of sewage treated is 500 to 600 gallons per square yard of filtering area per 24 hours: the aerobic beds are only 2 ft. thick on account of want of fall. The sewage of Southwold is very strong as indicated by analysis, but the effluent is also shown by analysis to be an excellent one. The result of a series of analyses of Southwold polarite oxidising bacteria effluents shows from 92 per cent. to 98 per cent. of purification, with average nitrates 3·36 grains per gallon. The system has been in operation since April 16 last. The chief object in adopting this bacterial system was to obtain the abolition of sludge. So successful, we are informed, has it been that arrangements are being made to treat the whole of the sewage by this system.

Winsford Reservoir. — Consternation was created at the Winsford Council meeting on the 2nd inst. by the receipt of a letter from the Local Government Board, the purport of which amounted to a condemnation of the new water reservoir which the Council had erected at Over. The work of constructing the reservoir was placed in the hands of the late Mr. Waring, engineer, of Winsford. On the death of the engineer, the services of Mr. H. Bancroft, C.E., of Manchester, were requisitioned, and he at once expressed the opinion that the design and construction were faulty, and that the reservoir would not hold water safely unless the Council were willing to expend, in addition to the 4,000*l.* they had already spent on the scheme, a sum of 3,000*l.* for strengthening purposes. The Council applied to the Local Government Board for sanction to borrow an additional sum of money, and the Board sent down an inspector to visit the works. The letter, which is based on the inspector's report on his visit, states "that the Board find that both the workmanship and the materials used in the construction of the reservoir had been exceptionally bad, the workmanship being of the roughest description." The Board would allow the necessary money to be borrowed, provided it was repaid in five years.—During a lengthy discussion the Council strongly repudiated the statement that the authority was to blame for lack of supervision. It was explained that the scheme was placed under the charge of a capable engineer, and the Council had carefully avoided interfering with the engineer, but they had always expressed their willingness to support him in exercising his powers. Moreover, they were of opinion that the work had been carried out almost entirely in accordance with the original plans of the late engineer, which the Local Government Board had passed, and, therefore, the Local Government Board had some responsibility in the matter which they seemed to wish to shirk.—Mr. Bancroft, the Consulting Engineer to the Council, stated that, in his opinion, the Board ought never to have passed such plans.—Several members were in favour of testing the reservoir by turning water into it, but Mr. Bancroft assured them that the structure would collapse and probably do great damage.—Eventually it was decided to call a special meeting to consider what should be done.—*Manchester Evening Mail.*

FOREIGN.

France.—The Grand Prix de Rome in the section of architecture has been awarded to M. Tony Garnier, pupil of MM. Blondel and Scellier de Gisors. The subject was "Un Hôtel pour le siège central d'une Banque d'Etat."——At the Hôtel de Ville, Paris, an exhibition has been held of the competition designs for the small buildings ("édicules") for access to the stations of the Metropolitan Railway from the Bois de Boulogne to the Bois de Vincennes. Three types of design were demanded; a general type, a special one for the Place de la Bastille, and a special one for the Place de l'Etoile. Twenty-one architects have taken part in the competition, but the result is not very satisfactory, most of the designs showing constructions too heavy and too prominent for the situations.——The Baroness Nathaniel de Rothschild, recently deceased, has left to the Louvre Greuze's picture, "La Laitière," as well as a collection of twelve fine examples of early Italian painting, and twenty water-colours by Jacquemart. To the Cluny Museum she has left various ancient coffers and all the objects of fifteenth and sixteenth century art which adorned the Château of Vaux-le-Cernay. Important legacies are also left to the Carnavalet Museum and to the Museum of Decorative Art.——It is feared that there will be another strike of the workmen engaged on the Metropolitan Railway for Paris.——M. Bartholomé, the sculptor, has been commissioned to execute a monument to the dramatist Henri Meilhac. It will consist mainly of a figure symbolising "L'Amitié," placing a coronet of flowers on the tomb.—— In the Rue Bonaparte,

Paris, the works have been commenced for a new Académie de Médecine, to be completed by the end of 1900.——A fine-arts exhibition for the Vincennes district will be opened in September at St. Mandé.——The Municipality of Creil has decided on the erection of a Hôtel de Ville, at a cost of 330,000 francs, and the formation of a public park.——The death is announced of the engraver Emile Boilvin, who was a pupil of Pils, the painter, and who executed his first engravings in 1868. He obtained medals at several Salons, and the "Grand Prix de Gravure" at the 1889 Exhibition, receiving on the same occasion the decoration of the Legion of Honour. The greater part of his work consisted of original designs for the illustration of various "éditions de luxe"; but he also made fine engravings from the works of the masters of the eighteenth century, and others from the works of modern painters—Courbel, Meissonier, &c.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The practice carried on in Singapore for some years past by Messrs. Swan & Maclaren as architects, surveyors, and civil engineers, will, as from July 1, be carried on by Messrs. J. W. Boyd Maclaren and R. A. J. Bidwell under the style of Swan & Maclaren.——Messrs. Ardron & Dawson, architects, have removed from 8, Delahay-street, Westminster, to No. 6, Old Queen-street, Westminster, S.W.——The Fireproof Partition Syndicate, Limited (Cunnah-Wright Patents), have taken offices at 10, York-buildings, Adelphi, W.C.

DOUGLAS FIR.—The properties of Douglas fir have recently been studied by Mr. Edward Mohun, M.Am.Soc.C.E., who has compiled the results of a number of earlier studies and deduced constants for use in the various formulas for beams and pillars of this material. For timber of the best quality, such as would be accepted by an inspector for bridge or trestle work, he adopts an ultimate tensile stress of 14,000 lbs., with a factor of safety of ten for obtaining the safe working stress, 5,000 lbs. for the ultimate crushing strength endwise with a factor of five, 500 lbs. for the ultimate crushing stress sidewise with a factor of three, 6,000 lbs. for the ultimate skin stress with a factor of three, 1,400,000 lbs. for the modulus of elasticity, 400 lbs. for the ultimate shearing stress with the grain with a factor of four, and 40 lbs. as the weight per foot. The ordinary life of a structure of such material, designed with the factors of safety mentioned, is believed to be about twelve years. Mr. Mohun has prepared some valuable tables giving not only various formulas based on these constants, but also the safe loads of Douglas fir beams and a comparison of the results which have been obtained by different investigators of the properties of this important material.—*Engineering Record.*

JOHNSTON'S MAP OF ENGLAND AND WALES.—This map, on a scale of three miles to an inch, issued by Messrs. W. & A. K. Johnston, will be complete on twenty-five sheets, of which numbers 3, 19 20, 24, and 25, are already published. These include the Cumberland and Westmoreland district, Surrey, Middlesex, Herts, Essex, Kent, Sussex, and South Hants. Each sheet is issued in a folding cover, mounted on linen, and a key map shows the numbering and the area of the remaining sheets. The map is based on the new revised edition of the Ordnance Survey, and has been revised by residents in nearly every district. The geographical features are shown in three different colours; the black shows all the names of places, estates, antiquities, and objects of interest to tourists, also outline of roads and railways; the blue shows all the rivers and canals with their names, county boundaries, steamer routes and sea depths; and the brown shows all the names of hills and glens, the contours for every 500 ft., and the heights above the sea level, the principal roads and the routes described in the British road book of the Cyclists' Touring Club are also filled in in this colour, making them prominent. The counties are distinguished by different colours in the usual manner, and all water is coloured blue. The map appears to be one of the best of its kind that has been issued. A map of Scotland on a similar scheme is in preparation.

A NEW FILE FOR NEWSPAPERS.—Carson's patent file is an invention for filing newspapers or articles so that they can be opened right back to the centre. It consists of two light pieces of metal to one of which the paper is attached by a wire threaded through it and through a specially provided small metal T-piece with a pointed end which is thrust through the paper. A clamping screw on the other slip of the metal clamps the ends of the wires, and all the papers held in the file can be opened out without taking them off it. It is a little more trouble to attach them than by the ordinary method, but when once done is much more convenient for reference.

REGISTER OF PATENT AGENTS.—In October or November next the Chartered Institute of Patent Agents will hold a final qualifying examination of candidates for certificates for enrolment on the Patent Agents' Register. The subjects of examination include English and foreign patent law and practice; the preparation, interpretation and criticism of specifications; the law and practice relating to designs and trade marks; applied mechanics; electricity; chemistry and heat; and mechanical drawing. The examination is open to solicitors (England and Ireland), law agents (Scotland), pupils or assistants during seven consecutive years of registered patent agents, and to those who have passed certain recognised preliminary examinations at the Universities, Sandhurst, Woolwich, and the College of Preceptors, to Whitworth scholars or exhibitioners, to graduates in arts, laws, or science, and so on.

PORTMAN MARKET.—Messrs. Gordon, Lowther, & Gunton have prepared plans and designs for the buildings, to be erected by a newly-formed company—the Portman Market, Limited—on the site of the present market in Church-street (St. Marylebone parish), and opposite the goods terminus of the Great Central Railway. The company is formed for taking a lease of the property from Lord Portman. The market, whose traffic has greatly dwindled of late years, was established sixty years ago, in pursuance of an Act, 11 Geo. IV. c. 71, additional powers being obtained under an amending Act, 2 and 3 William IV., c. 113; the lease will be for a term of fifty-eight years from March 25 last, at a ground rent of 200*l.* for the first year, 600*l.* for the second year, and 1,000*l.* for the third and following years. The estimated cost of the new building, with cold storage, offices, and equipment, will not exceed 65,000*l.*, and it is expected that the rents (14,900*l.*) and tolls will yield a total revenue of 20,400*l.*, of which 9,750*l.* is allotted by the promoters to ground rent, maintenance, and other annual charges. Mr. John Baker, the vendor, fixes the purchase price for the lease and market rights at 40,000*l.*

PUBLIC IMPROVEMENTS, BELFAST.—A Local Government Board inquiry regarding several loan applications by the Belfast County Borough was held recently in the Town Hall by Mr. P. C. Cowan. The sums sought for included 15,000*l.* for paving of streets, 10,000*l.* for flagging footways, 10,000*l.* to provide a refuse destructor, 30,000*l.* to erect a public abattoir, 8,000*l.* to erect a model lodging-house for men, and 75,000*l.* for electric lighting purposes. Mr. Bretland, City Surveyor, gave evidence as to the several loans.

L.C.C. TECHNICAL EDUCATION SCHOOL.—An installation of incandescents has just been made by the New Sunlight Incandescent Co., Limited, at the Technical Education School of the London County Council, St. Martin's-lane, London, W.C.

GAS AND ALLIED TRADES' EXHIBITION.—It is proposed to hold an annual exhibition comprising appliances used in the production and making of gas, carbonising, purifying, &c., gas lighting, gas heating, gas cooking (with practical demonstrations), and gas traction. The first exhibition will be held, from next December 21 to January 23, at the Royal Aquarium, Westminster. An official catalogue will be issued giving a short account of the exhibition as well as a description of exhibits.

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.—At the last meeting of the Council of the National Photographic Record Association the President, Sir J. Benjamin Stone, M.P., in the chair, 135 photographs were presented, taken by Messrs. B. Diveri, Basil C. Lawrence, E. Scamell, and Geo. Scamell, hon. sec. The subjects included Elgin Cathedral, some of the old houses in and round London, Waltham Abbey, and the churches and monuments at Hendon Ickenham, Wheathampsted, Biggleswade, Sandridge, St. Luke's, Chelsea, &c. These will be forwarded immediately to be added to the collection at the British Museum.

WYCOMBE ABBEY.—Wycombe Abbey, formerly the Bucks residence of Earl Carrington, is about to lose one of its distinctive features—viz., the handsome Rupert gates bearing the Carrington coat-of-arms, and the lodge and tower of Norman architecture. They were removed from the former main entrance to the High-street at the time Earl Carrington was Governor of New South Wales. The buildings are now to be taken down and re-erected in precisely the same style on the Marlow Hill, a mile distant, at the entrance to the noble Earl's new residence, Daw's-hill.—*Standard.*

CARPENTERS AND JOINERS.—The August report of the Amalgamated Society of Carpenters and Joiners states that on their invitation a conference was recently held between themselves, the two other national societies of joiners, and the Alliance Cabinet-makers, the Amalgamated Union, and the United Association of Scotland. The conference was called to establish an agreement between the joiners and the cabinet-makers relative to the demarcation of work between the two sections of employés. It was reported at the conference that many firms which originally confined themselves to furniture making have developed into contractors for all kinds of inside fittings both in public and private buildings, and that in these employments the members of the carpenters and joiners' society, and those of the cabinet-makers' societies, are intermixed to so great an extent that the only distinction remaining is the card of membership they carry. A large number of carpenters and joiners are also engaged in making all kinds of movable furniture, such as tables, bookcases, wardrobes, drawers, desks, &c. This renders the demarcation question as between the joiners and the cabinet-makers too intricate to be satisfactorily settled in any hard and fast manner. The resolutions carried by the joint representatives were as follows:—(1) "That this joint conference of the representatives of the cabinet-makers' and joiners' trade societies, after a prolonged discussion on the question of the constantly recurring friction between members of the respective societies on the various classes of work upon which they may be engaged, considers that the attempt to define what work should be done by the members of the respective societies is impossible. But in order to put an end to these deplorable disputes, the only solution of the difficulty, in our opinion, is that in all cases where joinery or cabinet and house-furnishing firms tender for and obtain such work as ship, bar, bank, office, hotel, and interior fittings of houses, that the members of the respective societies working for such firms should on no account accept other than the highest rate of wages and conform to the conditions and privileges that may be established by the unions engaged in the wood-working trades in that particular district." (2) "In the event of any dispute arising between the members of the carpenters and joiners' and cabinet-makers' trade societies who may be working together, if not settled locally, the matter in dispute shall be laid before the respective Executive Committees, the men to remain at work until investigation is made into the cause of the dispute. Further, the Executive Committees of the above societies pledge themselves to deal with such cases within seven days from the time notice of such has been brought to their attention. Investigations into the causes of complaint to be made on the spot, if necessary."

NEWCASTLE INFIRMARY COMPETITION,—Mr. Frank Caws, of Sunderland, writes to say that in our remarks last week on his design in this competition there is a slight error. We state that there are eight towers; there are only two.

RIBCHESTER ROMAN CAMP.—Interest has been aroused in archæological circles by the recent discoveries at Ribchester—a village situated on the banks of the River Ribble, about twelve miles from Preston. Inscribed altars, coins, and other relics of the Roman occupation have been found here from time to time. Recent investigations which have been carried out by Mr. John Garstang have resulted in the accurate delimitation of the camp. It is rectangular in form, and about six acres in extent. A few days ago, while digging in the village graveyard, close to the church, Mr. Garstang came upon the ruins of a Roman granary.

CAPITAL AND LABOUR.

DISPUTE IN THE HULL BUILDING TRADE.—A conference between the Hull master builders and men connected with the building trade was held on the 15th inst., at which a resolution passed at a meeting of the masters on Monday evening was read. This resolution reaffirmed the masters' determination not to give way on the question of freedom of employment. The men thereupon called out that that would never be, and left the conference in a body. The masters declare their intention to at once open their shops to all men willing to work. The men are very confident that they will force the masters to accept their terms. The masters say they are quite willing to give ½d. per hour advance, to commence on the 26th inst. They also declare that they will stand to the fullest extent by all men who will work for them, and that they will seek no further conference with the dissatisfied operatives.

LEGAL.

CHARNOCK *v.* COURT.

THE action "Charnock and others *v.* Court and others," which was heard during the West Riding Summer Assizes, arose out of an industrial dispute which occurred in Halifax during the course of last year. Mr. Tindal Atkinson, Q.C., Mr. H. F. Manisty, and Mr. Shepherd appeared for the plaintiffs, who were the members of the Halifax Master Carpenters' and Joiners' Association; the defendants, who were officials of the Amalgamated Society of Carpenters and Joiners, Halifax branch, being represented by Mr. Lawson Walton, Q.C., Mr. Scott-Fox, Q.C., and Mr. Waugh. Before the case was called on Mr. Atkinson stated that an arrangement had been arrived at. An injunction had been granted by Mr. Justice Stirling, and it had been agreed that the injunction with certain additions and modifications should be made perpetual. Mr. Walton said that he was pleased to have been able to see his way to advise his clients to agree to the terms of settlement which had been mentioned. There was no suggestion that there had been any harsh or violent conduct on the part of the men, but, on the other hand, the men had, with regard to one matter, infringed the law, as was stated in the very carefully-considered judgment of Mr. Justice Stirling. The learned Judge, in making the injunction perpetual upon the terms agreed upon, said that he was very glad that a settlement had been agreed upon, as it would have been unwise at such a time to do anything which would in any way embitter the feelings of the opposing parties. By consent no order was made as to costs.

ARCHITECT *v.* BUILDER.

At the Ashton-under-Lyne County Court recently, before his Honour Judge Yate-Lee, Thomas W. Hudson, architect, Manchester, sued George H. Walker, builder, Dukinfield, for 11*l.* 10s., balance of account alleged to be due in respect of designs of property prepared by plaintiff at defendant's instruction. Mr. E. C. Pearson, solicitor, Manchester, was for plaintiff, and Mr. Wilkinson (Messrs. Booth & Wilkinson, solicitors, Ashton) represented defendant. It appears, from Mr. Pearson's statement, that plaintiff was introduced to defendant in March, 1897, and a short time afterwards defendant gave him instructions to prepare plans of ten cottages, and later on of two villas in Crescent-road Considerable correspondence had passed between the parties, and ultimately plaintiff agreed to reduce his bill for professional services from 50*l.* to 45*l.*, and on that account several payments had been made, leaving the balance as claimed.—The defence was that defendant had paid sufficient, inasmuch as he had had to pay for the erection of a staircase, for which he held plaintiff was liable. —His Honour gave judgment for 12*l.* 10s., execution not to issue pending the settlement of other questions involved with respect to certain matters between the parties. —— An action was then heard in which Mr. Walker was plaintiff and Mr. Hudson was defendant. The case for the plaintiff was that Mr. Hudson was architect for two villas, Woodville and Highbank, and these were not built in accordance with the specifications. Plaintiff did the building, but the plumbing and joinery was left to defendant. When the villas were finished. a Mr. Hague (who purchased one of the villas) declined to have the staircase on account of its not being in accordance with the specifications. Mr. Wilkinson argued that defendant had shown negligence in not seeing that the work was properly done. His honour said there had been no evidence to show that Mr. Hudson was responsible. He would give a verdict for defendant.

AN ARCHITECT'S CLAIM FOR ABANDONED SCHEMES.

In the Nisi Prius Court at the Glamorgan Assizes recently, Mr. Justice Kennedy and a special jury were called upon to decide a claim for professional services rendered by Mr. H. W. Wills, architect, who sued the Mayor of Swansea and others representing the Swansea Intermediate Education Committee.

Mr. Edwin Seward, architect, of Cardiff, gave evidence as to the scale of charges in vogue with the profession, and said he had examined the drawings, &c., prepared by the plaintiff, and found them very ably done.

Mr. Lanchester and Mr. Pickwell, architects, gave similar evidence.

Mr. B. Francis-Williams, in his speech for the defence, said the Committee had desired, whilst safeguarding the interests of the ratepayers, to pay plaintiff what was just and right. They contended that the 250*l.* they had paid in was an ample sum under the circumstances. The buildings had had to be abandoned. The plans were on too expensive a scale, and plaintiff then charged for another set modifying them.

His Lordship said he could not see what possible reason there was for defendants declining to pay, at any rate, for the first set of plans. How could they possibly blame the architect for producing an expensive scheme when they themselves approved of it and sent it to the Charity Commissioners? With regard to the second set, possibly they might consider that the alterations were not so great as to justify the whole claim. It was for the jury to consider whether they would award less than was claimed or anything at all for those plans.

The foreman of the jury at once intimated that the jury had agreed upon the 551*l.* 12s. 11d. suggested by the plaintiff—that amount to be inclusive of the 250*l.* paid in by the corporation.

Judgment was given accordingly for 301*l.* 12s. 1d., with costs, a special jury being certified for.

ANCIENT LIGHT DISPUTE CASE IN THE VACATION COURT.

The case of Iceton *v.* The London United Tramways, Limited, which is an action assigned to Mr. Justice North in the Chancery Division, came before Mr. Justice Cozens-Hardy, sitting as vacation judge, on the 16th inst., for an interlocutory injunction restraining the defendants until the trial from erecting a building so as to obstruct the plaintiff's ancient lights.

Upon the case being called on, Mr. Marshall, Q.C., on behalf of the defendants, asked for time to answer the plaintiff's affidavits, which, he said, had only recently been filed.

Mr. Alexander, Q.C., for the plaintiff, said that if an adjournment were granted, the defendants ought to give an undertaking not to interfere with the plaintiff's light in the meantime. He (counsel) was instructed that the defendants were still carrying on their building operations.

His Lordship: They will, of course, do it at their own risk. I cannot hear this motion without giving the defendants an opportunity of answering your affidavits.

Mr. Alexander: This is a very serious matter, my lord. Will your lordship give me leave to amend my notice of motion by asking that the defendants shall be ordered to pull down any building put up between now and Wednesday next.

His Lordship: Yes.

After further discussion it was arranged that defendants should file their affidavits by noon on the 19th inst., and that the plaintiff should file his affidavits in reply by the 22nd inst.

COMPENSATION FOR ANCIENT LIGHTS.

In the Consistory Court of London on the 15th inst., Dr. T. H. Tristram, Q.C., as Chancellor, granted a faculty in an application concerning ancient lights in Bloomsbury. The Rev. Boyd Boyd-Carpenter (rector of St. George's parish church, Bloomsbury) recently took proceedings in the Court against Mr. Truslove, a hotel proprietor, to restrain him by injunction from interfering with the ancient lights of St. George's Church. Mr. Truslove had decided to build a temperance hotel on the east side of the church, and it was thought this would interfere with the light. A compromise, however, had been effected between the parties. By the agreement come to 1*l.* a year would be paid to the Rector, and a lump sum of 1,250*l.* as compensation. —The Chancellor granted a faculty confirming the agreement. He ordered the 1,250*l.* to be paid to the Rector and Churchwardens at once, pending the decision in Chambers as to who should be eventually appointed trustees of the money.—*Daily Graphic.*

MEETINGS.

Saturday, August 26.

Incorporated Association of Municipal and County Engineers.—Western District Meeting, Portland.

RECENT PATENTS:

ACCEPTED SPECIFICATIONS.

Open to Opposition until October 10.

[1898] 10,023, Haigh, Acetylene Gas Machines for House Lighting, &c. 16,640, Church, Apparatus for Use in Modelling, Decorating, and Otherwise Working in Plastic Materials. 17,626, Watson, Cord Grips for Electrical Lamp Holders. 18,043, Lakers, Safety Links or Hooks for the Prevention of Accidents in Over-winding. 18,088, Nicholson, Paint Brushes. 18,272, Elphinstone & Heap, Measurement of Alternating Currents. 18,514, Potter, Gas Burners. 18,770, Riley & Kershaw, Gas Holder. 18,931, Jourdan, Copying or Enlarging Drawings or Designs. 18,978, Whiteley, and 20,039, Thornton, Guards for Circular Saws and other Machines. 19,052, Anslow, Front-door Locks fitted with both Latching and Locking Bolts. 19,252, Humphrey, Heaters for Baths, &c. 19,384, Wheeler, Brakes for Trolleys, &c. 19,908, Gautier, Automatical Flushing for Sanitary and other Purposes. 20,008, Lawton, Metal Covers for Switches, Cut-outs, &c. 20,078, Hopper, Spigot and Socket Joint for Sanitary Pipes. 20,118 Reeves, Purification of Sewage Effluents. 20,348, Lefèvre, Brakes and Clutches. 20,524, Bardot, Ignition of Incandescing and other Gas Burners. 20,637, Douglas, Astragals for Glazing. 20,669, Pretzel, Couplings for Ropes, Cord, &c. 20,743, Mullan, Manhole Covers. 20,759, Soc. "Les Fils d'Adolphe Mougin," and [1899] 3,311, Toerring, Electrical Arc Lamps. 20,792, Hancock, Means for Opening and Closing Window Casements, &c. 21,038, McConechy, 24,002, Troubetzkoy. [1899] 6,274, Sunderlands & Marshall, and 11,116, Fenderl, Generation of Acetylene Gas. 21,133, Appleton, Window and other Fasteners. 21,374, Raster, Rheostats or Electrical Heaters. 21,771, Lamplough, Pulverising Machines. 24,941, Howl, Drying Bricks, &c. 27,198, Martini, Gas Ignition. [1899] 434, Nuber, Apparatus for Flushing Water-closets. 1,573, Kleber, Production of Building Stones, Bricks, &c. 3,591, Ericsson, Telephone Systems. 5,822, Beeck, Size Powder. 6,417, Walker, Glazing for Roofs. 7,983, Weaver & Houghton, Flexible Pipe Connexions. 8,044, Greenfield, Metallic Conduits for Electrical Wires. 9,302, Kavanagh, Sawing, Planing, and similar Machines. 10,537, Feustel, Wire and similar Brushes. 10,744, Lobdell, and 13,732, Lee, Storage Batteries. 11,237, Caplens, Apparatus for Rubbing Bricks, &c. 11,285, Boles, Fixing Screw-bolts, Hooks, Rings, &c., to Walls. 12,039, Roske, Moulded Brick for Ceilings, &c. 12,289, Linzel, Apparatus for simplifying Statical Mensuration for Girders, &c. 12,429, Salzenberg, Incandescent Gas Light. 12,467, Rühling, Apparatus for Lifting Building Materials. 12,792, Beyer, Means for Supporting Sliding Windows, Shutters, and Blinds at any desired height. 12,999, Weijers, Burning and Drying Kilns and Furnaces. 13,101, Berry, Hydraulic Jib Cranes. 13,173, Pattinson, Brush-handle Socket. 13,324, Stone, Adjustable Cradles or Staging for use in Decorating Buildings, &c. 13,640, Parsons, Sash Fastener. 13,723, Nicolai & McNab, Production of Gas for Incandescent Lighting and for Heating. 13,797, C. W. Hunt Co., Endless Conveyors. 13,802, Thomson & Cox, Multi-rate Electrical Meters. 13,844, Everson, Compound Metal Tubes. 13,888, Hadden, Illuminating Gas Apparatus.

ABSTRACTS OF PATENTED INVENTIONS.

8,697.—Cranes: *W. R. Green.*—The inventor's object is to balance the jib during the process of luffing; he mounts two volute-shaped pulleys upon the drum shaft, connects a flat rope to the drum, and attaches a balance weight to a cross-bar to which the other ropes are joined; the leverage of the balance-weight diminishes with the rising of the jib; the weight may be attached to the drum and the flat rope to the volute.

8,729.—Ventilating and Heating: *R. P. Fisher.*—The boilers, preferably saddle-shaped, and made in sections, are laid one above the other over the one furnace; one section supplies hot water, another section supplies the low-pressure steam. In one adaptation, for a boiler connected to a radiator flooring and a spiral ventilator, the space between two boilers serves for a flue from the furnace, and a receiver on the outer boiler is arranged for generation of low-pressure steam, which is conducted to the radiators or to parts of the building to effect its ventilation, the heated water being circulated at the same time.

8,767.—Enamelling Metal Articles: *C. A. Fuge.*—In order to minimise the danger of lead poisoning, and to simplify the process of enamelling, the enamel or glazing material is applied when in a molten state. The cleaned articles are immersed when in a hot or a cold condition in a bath of molten enamel, or the enamel may be poured over them.

8,786-7.—Door and Window Fasteners and Stays: *W. Youlten.*—One end of a stay for casement windows and doors is pivotted to a plate on the casement, and its other end passes with the closing of the window into a mortise in the hanging jamb. A sliding bolt to be pushed into one of the holes in the stay retains the casement in any desired position, and the contrivance leaves clear almost the entire opening between the sides of the frame. The inventor's pivot adjustment for windows provides a centre for centre-hung windows, and dispenses with the customary stay. On to opposite sides of the stile are fixed two plates having concentrical arc-shaped flanges, which fit in a circular channel of another plate upon the window frame. Holes in the latter plate receive a spring bolt in one of the two other plates, and so the window is held as required.

8,816.—Floors and Ceilings: *J. Feketehazy.*—The main girders, of cement or concrete with metal bars and tie-rods embedded therein, are built in between the walls. Then the ceiling or lower part of the floor is made of concrete or cement upon wire netting, and the main part of the floor is laid upon frames so as to leave a central space for ventilating or heating appliances. The centering frames are taken out through the central opening (to be closed by plates) when the concrete of the half-arches has set. The wire netting embedded in cement takes up the tensile stresses, and from the concrete arches may be suspended the ceiling, chandeliers, &c.

8,884.—Joints of Pipes and Tubes: *J. Spencer, T. H. Spencer, & H. S. Swallman.*—The invention is applicable to conduits for electrical conductors, to telegraph posts, and to similar objects. In one form, especially adapted for conduits, a butt joint is employed having tapered sleeves driven into the ferrule. In another form, the wrought-iron or steel tube is enlarged, and then tapered at its end to fit into the tapered socket in the base of a telegraph post; or a junction-piece, screw-threaded on both its outside and inside, is made for joining large tubes to small tubes, which are correspondingly screw-threaded. The patent extends to further modifications of a similar kind.

8,941.—Treatment of Sewage: *J. Hastwell.*—Sewage is treated with an admixture of soda, copperas, alum, hydrochloric acid, milk of lime, and chloride of lime, dissolved in water or by means of steam. For use with cold water, soda, alum, and copperas are first mixed in boiling water, and then are added charcoal, quicklime, Paris white, French chalk, chloride of lime, and hydrochloric acid.

8,961.—Soldering-lamps: *P. & J. J. Heins.*—In order to control the gas supply automatically according to the pressure of air in the blow-pipe, which may be worked by a foot bellows, a branch pipe is made from the blow-pipe to a casing and has its end formed with an expanding bulb that rests against an arm upon a spindle mounted in the side of a gas chamber and carrying a valve; the pressure of air, extending the bulb, regulates the opening of the valve, and, thereby, the passing of gas to the lamp; a spring or weighted arm upon the spindle shuts the valve when the air supply ceases.

9,006.—Gulley Traps: *J. Alsop & J. Brightmore.*—The disinfectant is put into a chamber made at the trap's front and sides, and communicating with the body of the trap through narrow vertical slits against which a dash-plate (or grooves) turns the sewage.

9,082.—Fixing Bristles in Brushes: *J. Matherson.*—The bristles of paint, paste, whitewash, and other brushes are secured by passing their tufts through round holes in the handle, and fastening them by wires inserted through other holes. The tufts may be doubled in the middle, or a single tuft only may be used.

9,108.—Walls, Ceilings, and Partitions: *Fireproof Plate Wall Company & C. H. Sidebotham.*—As a modification of No. 18,583, of 1893, double vertical perforations, instead of single central perforations, are made in the cement, plaster of Paris, or other slabs, together with small holes extending from the bottom edge of each slab almost to its top. The latter holes are closed with cement when the slabs are laid, and cement is filled in the perforations. The grooved edges of the slabs are also cemented, or the edges may be tongued and grooved to interlock, and stay-rods, fitted with screw couplings, are inserted, if needed, in the perforations.

9,120.—Moulding of Earthenware Pipes: *J. Hall.*—The socket ring is formed in two parts, in order that the pipe may be curved or bent as it leaves the die; the one part is fixed to, or made integrally with, a ring around the socket core, and having feet which rest upon a plate hinged to the table; the other part is cast in one piece, with a ring that serves for the collar or curved portion of the socket, and has lugs for attaching it to the machine's mouth; a bent guide-lug, fixed to the ring around the socket core, bears against the socket part, whilst a guide-band enables the lug to prevent a separation between the halves of the ring as the socket is being fashioned. For making a curved pipe the pipe is bent by hand as it comes from the die, the table with the half ring being allowed to fall clear from the socket; for tilting straight pipes the hinged plate is employed, and, if a shorter socket is required, a loose ring is placed upon the plate.

9,123.—Testing Road Surfaces: *J. Brown.*—The machine records irregularities of surface along certain distances; it consists of a sledge-shaped frame to whose middle is pivotted an arm whereof the free end bears a revolving toothed wheel that freely follows the road's contour and is geared with a drum between which and a pressure roller is fed a paper strip, the arm is linked to another pivotted arm that carries a tracing pencil, a fixed pencil drawing a datum line for reference, the toothed wheel's vertical displacements are integrated on a counter driven by a pulley; in one shape the driving is effected by two cords that end in springs whereof one is attached to the frame and the other to the end of the first-named arm, affording a silent feed for rotating the pulley, in one direction only, in proportion to the movement downwards of the end of the arm, a bell upon a spring frame presses a roller against the storage roller of the paper strip causing it to rise until a projection rings the bell, and so announces that a given distance is covered or a given length of paper is used

9,134.—MINING SURVEYING INSTRUMENTS: *W. F. Stanley.*—To adapt miner's dials or theodolites for sighting straight up and down, the inventor places at the telescope's end a cap which is guided by a projection and slot and carries a bracket upon which a mirror can be adjusted accurately at 45 deg., in one form the support of the Y's—shortened for the purpose—is bent out so as to clear the limb, whereby the telescope itself can be turned into the vertical position.

9,167 and 9,181.—FLOORS, WALLS, CEILINGS, &c.: *H. L. Cunnah & H. A. Hughes.*—Metal or other corrugated sheets are punctured from each side so as to leave projecting edges, placed between the flanges of girders and uprights of I or channel section, and then plastered over with a compound of Portland cement one part and coke breeze four parts; for partition plates or slabs the sheets are embedded in the plastic material and then cemented together and plastered over when in position. For protecting the girders from fire, clips suspend the ceiling from the lower flanges, slots in the clips receive the ceiling joists, I-shaped in section, and wedges secure the latter above or under the upper flanges, between the joist flanges are inserted corrugated metal sheets plastered over for a level ceiling beneath the girders, concrete arches are laid upon angle-iron bars fixed to the girders, or concrete may be filled in the spaces between the girders.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 1.—By E. H. HENRY.

Clapham.—4, 5, and 6, Crescent-ter., u.t. 50 yrs., g.r. 7*l.* 10s.	£750
49 and 52, Park-cres., u.t. 51 yrs., g.r. 6*l.* 6s.	505
7, Acre-sq., f.	220
Wandsworth.—Milton-st., Milton Cottage, u.t. 11 yrs., g.r. 7*l.*, r. 48*l.*	140

By MATTHEWS & MATTHEWS.

South Lambeth.—Wyvil-rd., f.g.r.'s 62*l.* 8s., reversion in 47 yrs.	1,970
Muswell Hill.—Colney Hatch-lane, Pinner Cottage, f., r. 80*l.*	1,725
Homerton.—34 to 63 (even), Wick-rd., f.	6,625

By NOKES & NOKES.

Clapham.—81 and 89, Grandison-rd., u.t. 85 yrs., g.r. 7*l.*, r. 72*l.*	690

By PHILIP STOCK.

Herne Hill.—25, Deronda-rd., u.t. 59 yrs., g.r. 8*l.* 8s.	370

By BEDFORD & CO.

St. John's Wood.—8 and 10, Abercorn-pl., f., r. 132*l.* 10s.	2,100

By GRAVES & SON.

West Ham.—Chaplin-rd., &c., f.g.r.'s 51*l.* 10s., reversion in 82 yrs.	1,180
Old Kent-rd.—Avondale-sq., i.g.r.'s 70*l.*, u.t. 55 yrs., g.r. 4*l.*	1,325
Chiswick.—35, Barrowgate-rd., u.t. 79 yrs., g.r. 12*l.* 2s. 6d.	600
Paddington.—5, Macroom-rd., u.t. 59 yrs., g.r. 7*l.*, r. 45*l.*	500

By TYSER, GREENWOOD, & CO.

Chiswick.—1 to 16, and 23 to 29, Dalton-rd., u.t. 66 yrs., g.r. 103*l.* 10s.	3,730

By ALFRED PREECE.

Ramsgate, Kent.—15, 16, 17, and 18, Osborne Villas, u.t. 66 yrs., g.r. 25*l.*, r. 74*l.*	550
3 and 4, Hamilton Villas, u.t. 80 yrs., g.r. 6*l.*, r. 38*l.*	330
Crescent-rd., Wellington House, u.t. 69 yrs., g.r. 5*l.* 10s., r. 20*l.*	135
4, Picton-rd., u.t. 80 yrs., g.r. 3*l.*, r. 17*l.*	175
59, 61, 63, and 65, Crescent-rd., u.t. 69 yrs., g.r. 17*l.*, r. 86*l.*	850
Grove-rd., a plot of building land, f.	110
The Elms, Southampton Villa, u.t. 80 yrs., g.r. 6*l.*, r. 36*l.*	400
Aylesbury, Bucks.—1 and 2, Ripon-st., u.t. 80 yrs., g.r. 9*l.*	470
Beckenham.—2 and 4, Birkbeck-rd., u.t. 80 yrs., g.r. 12*l.*	490
14, 16, and 18, Birkbeck-rd., u.t. 77 yrs., g.r. 15*l.*	465

By WINCH & SONS (at Ashford).

Woodchurch, Kent.—Shirley House and Counter Farms, 284 a. 1 r. 28 p., f. (in lots)	6,035
Bethersden, Kent.—Great Odgian Wood, 15 a. 2 r. 28 p., f.	160

By GARROD, TURNER, & SON (at Ipswich).

Henley, &c., Suffolk.—The Henley Hall Estate, 357 a., f. (in lots)	6,015

By EDWARD BOND (at Thame).

Chinnor, Oxon.—Two enclosures of arable, 22 a. 3 r. 15 p., f.	760
A freehold residence and 2 a. 3 r. 31 p.	500
A freehold house and shop, r. 16*l.*	260
Longwick, Bucks.—A farmhouse and 14 a. 3 r. 16 p., f.	1,030

By FIELD & BLADES (at Masons' Hall Tavern).

Highgate.—High-st., the "Angel Inn," u.t. 83 yrs., r. 140*l.*, with goodwill	7,700

By J. & S. MOTION (at Masons' Hall Tavern).

Hampstead.—311, Finchley-rd., u.t. 13 yrs., r. 150*l.*	560

By HY. SPENCER & SONS (at Gainsborough).

Marton, Lincs.—Marton Grange Estate, 107 a. 3 r. 37 p., f.	£2,268

August 2.—By BRADSHAW BROWN & CO.

Woolwich.—Lower Woolwich-rd., part of the Royal Dockyard Wharf, area 23,389 ft., f.	3,500

By NOTT & CARTWRIGHT.

Chiswick.—73 to 77, 81 to 85 (odd), The Avenue, u.t. 96 yrs., g.r. 35*l.*, r. 277*l.* 10s. (in lots)	1,730
Pimlico.—73, Pulford-st., u.t. 38 yrs., g.r. 1*l.*, e.r. 65*l.*	400

By REYNOLDS & EASON.

Croydon.—32, Westbury-rd., f., r. 28*l.*	330
Willesden Green.—20, Huddlestone-rd., f., r. 30*l.*	380
312 and 314, High-rd., u.t. 85 yrs., g.r. 10*l.*, r. 65*l.*	425
Bethnal Green.—45 and 47, Moss-st., f.	705

By E. & S. SMITH.

Muswell Hill.—Wilton-rd., a corner plot of land, f.	150

By TRIST & CO.

Balham Hill.—High-rd., Tregothnan, u.t. 68 yrs., g.r. 24*l.* 12s. 6d.	550

By WAGSTAFF & SONS.

Crouch Hill.—28, Sparsholt-rd., u.t. 47 yrs., g.r. 6*l.*, r. 32*l.*	310

By FRANK JOLLY & CO.

Homerton.—5 to 15 (odd), Gilpin-rd., u.t. 82½ yrs., g.r. 33*l.*	£1,090
Bow.—12, Coborn-rd., with slaughter-house in rear, u.t. 17 yrs., g.r. 3*l.* 10s., r. 50*l.*	300
Mile End.—129 and 131, Redman's-rd., f.	725
115 and 119, Redman's-rd., f.	855
Stepney.—58, Gold-st., f.	365
Mile End.—44, Rutland-st., u.t. 7½ yrs., g.r. 2*l.* 10s.	105
39, Bedford-st., u.t. 17 yrs., g.r. 12*l.*	130
Stockwell.—16 and 18, Andalus-rd., u.t. 76 yrs., g.r. 12*l.*, r. 62*l.*	650

By J. H. BRADWELL & SONS (at Nottingham).

Staunton, Notts.—The Staunton Grange Estate, 206 a. 0 r. 20 p., f.	6,500

By YOUNG & HOWES (at Wootton Bassett).

Tockenham, Wilts.—Shaw House Farm, 70 a. 2 r. 37 p., f.	3,450
Various enclosures, 51 a. 1 r. 5 p., f.	2,550
Lyneham, Wilts.—Various enclosures, 22 a. 2 r. 10 p., f.	865

By W. DEW & SON (at Pwllheli.)

Llaniestyn, &c., Carnarvon.—The Cefn Amwlch Estate (outlying parts) about 501 a. f. (in lots)	13,420

August 3.—By CHESTERTON & SONS.

Kensington.—31, Camden-grove, u.t. 76 yrs., g.r. 23*l.*	990

By COCKETT & HENDERSON.

South Woodford.—2, Nuremberg Villas, f.	1,380

By P. J. DIXON & SON.

Poplar.—36, East India-rd., u.t. 31 yrs., g.r. 5*l.*, r. 40*l.*	300
Bow.—46 and 48, Rounton-rd., u.t. 63 yrs., g.r. 7*l.* 10s.	565

By GLASIER & SONS.

New Bond-st.—Nos. 39 and 40, Corporation lease, g.r. 16*l.*, r. 550*l.*	17,000

By E. & H. LUMLEY.

Croydon, Surrey.—The Coombe Lodge Estate, 47 a. 1 r. 12 p., f.	21,100

By MOSS & JAMESON.

Chancery-lane.—18, Took's-court, f., e.r. 150*l.*	1,950
St. John's Wood.—13, Woronzow-rd., u.t. 35 yrs., g.r. nil, r. 55*l.*	500
29, Loudoun-rd., u.t. 38 yrs., g.r. 8*l.* 10s., r. 52*l.* 10s.	400
57, Blenheim-ter., u.t. 65 yrs., g.r. 12*l.*, r. 45*l.*	370

By T. G. WHARTON.

Peckham.—East Dulwich-rd., f.g.r.'s 30*l.*, reversion in 69 yrs.	830

By WINCH & SONS (at Maidstone).

Marden, Kent.—The Pattenden Estate, 232 a., f.	7,440
Turkey Farm, 17 a. 3 r. 37 p., f.	800
Goudhurst, &c., Kent.—The Poplars or Dodges Farm, 48 a. 2 r. 35 p., f.	1,800
Park Field, 9 a. 1 r. 15 p., f.	230
Headcorn, &c., Kent.—America or Link Farm, 21 a. 0 r. 30 p., f.	800

August 4.—By ARTHUR BARTON.

Regent's-pk.—4, Brunswick-pl., u.t. 24 yrs., g.r. 3*l.* 6s., r. 110*l.*	1,050
Edgware-rd.—Nos. 127 and 129, u.t. 21 yrs., g.r. 16*l.*, r. 230*l.*	1,810
Nos. 440 and 448, u.t. 22½ yrs., g.r. 66*l.*, r. 172*l.*	1,010
Paddington.—3, Eastbourne-ter., u.t. 39 yrs., g.r. 6*l.*, r. 70*l.*	660
Marylebone.—22, High-st., u.t. 4 yrs., g.r. 30*l.*, r. 130*l.*	300
65, Mortimer-st., u.t. 19 yrs., g.r. 12*l.*, r. 110*l.*	750
Hyde Pk.—49, Oxford-ter., u.t. 33 yrs., g.r. 15*l.*, r. 128*l.*	1,210
Bayswater.—35 and 37, Queen's-rd., u.t. 12 yrs., g.r. 42*l.*, r. 120*l.*	350
Regent's Pk.—26, Ulster-pl., u.t. 24 yrs., g.r. 20*l.*, r. 140*l.*	1,000
Marylebone.—6 and 6A, Upper Pk.-pl., u.t. 21 yrs., g.r. 8*l.*, r. 51*l.*	250
Pimlico.—12A, Winchester-st., u.t. 34 yrs., g.r. 6*l.*, r. 40*l.*	280

By CHARLES WILLIAMS.

Putney.—1, Cedar-gardens, f., r. 50*l.*	700
73, Chelverton-rd., u.t. 87 yrs., g.r. 7*l.* 15s., r. 48*l.*	500
Fulham.—21, Oxberry-av., u.t. 86 yrs., g.r. 7*l.*, r. 36*l.*	320
South Kensington.—3, Gloucester-ter., lease 7¼ yrs., g.r. 65*l.*, r. 150*l.*	300

August 8.—By WYATT & SON (at Havant).

Havant, Hants.—West-st., copyhold business premises, with house and store adjoining	1,500
37, North-st., f.	190

August 9.—By HEPPER & SONS (at Leeds).

Leeds.—12, Newton Grove, f., r. 40*l.*	1,020
74, Cardigan-rd., f., r. 33*l.*	600
2, 4, and 6, Delph Mount, f., r. 46*l.*	975
14, 16, and 18, Delph-lane, and 2, 4, and 6, Providence-av., f., r. 80*l.*	1,520
1, 1A. 3 to 21 (odd), Providence-av., f. r. 206*l.* 19s.	3,620
8 to 20 (even), Providence-av., f., r. 117*l.* 12s.	2,120
Foster's buildings, eleven cottages and stables, f., r. 105*l.* 19s.	1,255
54 and 58, Woodhouse-st. and works adjoining, f., 54*l.* 5s.	1,625
17, 19, and 21, Little Bridge-st., and 8, 9, 12, 13, 14, and 19, St. John's-sq., f.	1,235
38 to 48 (even), Tong-rd., also two houses and land adjoining, f.	6,000
6 and 8, Radnor-place, and 5 and 7, Little Radnor-st., f.	750
29 to 35 (odd), Durham-st., and 32 to 38 (even), Newcastle-st., f.	755

August 10.—By NEWBON, EDWARDS, & SHEPHARD.

Canonbury.—51, Halton-rd., u.t. 19 yrs., g.r. 8*l.*, r. 38*l.*	155
Islington.—87, Cloudesley-rd., u.t. 23½ yrs., g.r. 4*l.*, r. 30*l.*	225
23, 51, and 53, Queensbury-st., u.t. 11¼ yrs., g.r. nil, r. 86*l.*	210
101, Essex-rd., u.t. 20 yrs., g.r. 20*l.*, r. 78*l.*	185
Holloway.—3, Beacon Hill, u.t. 43 yrs., g.r. 9*l.*, r. 48*l.*	430

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS:

WOOD.*

Per Petersburg standard hundred.

	£ s. d.	£ s. d.
White Sea: first yellow deals	17 0 0	18 0 0
Second do.	13 5 0	14 15 0
Third do.	11 10 0	12 15 0
Battens, 40s., 30s., and 15s. less respectively.		
Petersburg: first yellow deals	13 15 0	16 5 0
Second do.	10 15 0	12 5 0
Battens, 30s. and 20s. less respectively.		
Petersburg, white deals	9 15 0	11 15 0
Do. white battens	8 5 0	9 15 0
Riga, white deals	8 5 0	9 5 0
Swedish mixed yellow deals	13 5 0	16 15 0
Third do.	12 5 0	14 15 0
Fourth do.	10 15 0	11 15 0
Fifth do.	9 15 0	10 15 0
Battens, 30s., 20s., and 10s. less respectively.		
Whitewood, 10 to 20 per cent. less.		
Finnish unsorted yellow deals	9 15 0	10 5 0
Battens, 10s. and 5s. less respectively.		
Whitewood, 5 to 10 per cent. less.		
Norwegian second yellow battens	8 5 0	9 5 0
Third do.	7 15 0	8 15 0
Fourth do.	7 5 0	8 5 0
Whitewood, 10s. less.		
Danzig, Crown Deck deals, per 40 ft. 3 in.	0 15 0	1 5 0
Brack	0 12 0	1 0 0
St. Lawrence Pine deals, &c., per P.S.H.:—		
1st, Bright and Dry, regular sizes	20 10 0	27 0 0
" " oddments	13 10 0	20 5 0
2nd " regular sizes	15 10 0	18 15 0
" " oddments	11 0 0	14 10 0
3rd " regular sizes	9 10 0	11 0 0
" " oddments	8 0 0	9 0 0
4th " regular sizes	7 15 0	8 10 0
" " oddments	7 0 0	7 15 0
St. Lawrence Spruce deals, &c.		
First, regular sizes	8 15 0	10 15 0
Second "	7 10 0	8 10 0
Third "	7 5 0	8 0 0
Fourth "	6 5 0	7 0 0
Oddments and battens at 20s., 10s., 7s. 6d., and 5s. less respectively.		
New Brunswick Spruce deals, &c.	7 5 0	8 0 0
Oddments, battens, and fourths	6 10 0	7 10 0
United States pitch pine planks and boards	8 5 0	11 15 0
Prepared Boards, per square		
1¼ by 6½ and 7 in. 1st yellow	11 6	14 9
" " 2nd "	10 0	11 9
1 by 6½ and 7 in. 1st "	8 6	10 9
" " " white	8 0	8 9
" " 2nd yellow	8 0	9 9
" " " white	6 6	7 3
⅞ by 6½ & 7 in. 1st & 2nd yellow	7 3	8 0
" " " white	6 9	7 6
¾ by 6½ and 7 in. 1st yellow and white (grooved, tongued, and beaded)	6 3	8 9
¾ by 6½ and 7 in. 2nd yellow and white (ditto)	5 3	7 6
⅝ by 6½ and 7 in. 1st yellow and white (ditto)	5 3	6 0
⅝ by 6½ and 7 in. 2nd yellow and white (ditto)	4 9	5 6
Narrower widths at 10 per cent. less. 3rd quality at 15 per cent. less than 2nd.		
Danzig and Memel Fir Timber— per load		
Best middling	2 10 0	3 10 0
Good middling and Second	2 0 0	3 5 0
Common middling	1 10 0	2 10 0
Undersized	1 10 0	1 15 0
Swedish and Norwegian Balks	1 5 0	1 15 0
Baltic Oak Timber—		
Danzig and Stettin—Large	3 5 0	3 15 0
Small	2 0 0	2 5 0
Quebec Timber per load		
Yellow Pine	3 15 0	5 10 0
Oak	4 5 0	6 5 0
Elm	4 17 6	5 15 0
Ash	4 2 6	5 5 0
Birch	3 7 6	5 5 0
New Brunswick, &c., Birch	2 2 6	2 17 6
American Pitch Pine Timber	3 6 0	4 0 0
Wainscot, per log, 18 cubic ft.—		
Crown (Eng. & Dutch) nominal	5 5 0	7 0 0
Brack nominal	4 10 0	5 10 0
Lathwood, per cubic fathom—		
Petersburg	4 0 0	6 10 0
Riga and Danzig	4 10 0	5 10 0
Norway Poles, per ft. run	0 0 1	0 0 1½
Oak Staves, per mille full size pipe		
Memel, Crown	210 0 0	220 0 0
Brack	180 0 0	190 0 0
Danzig	165 0 0	175 0 0
Bosnia, single Barrel (nominal)	28 0 0	30 0 0
United States, Pipe	35 0 0	42 10 0
Hogshead, extra heavy and double extra	27 10 0	32 10 0
Indian Teake per load	11 15 0	16 15 0
British Guiana Greenheart	0 0 0	8 0 0
Mahogany, per foot superficial—		
Honduras, cargo average	0 0 4½	0 0 6
Nicaragua, do.	0 0 4½	0 0 5½
Tabasco, do.	0 0 4	0 0 6½
Mexican, do.	0 0 3½	0 0 4
Panama, do.	0 0 3	0 0 4
African, do.	0 0 3½	0 0 5
Cuba, do.	0 0 5½	0 0 7½
St. Domingo, do.	0 0 5	0 0 7
Do. Curls (good to prime)	0 0 9	0 1 3
Walnut, American (logs)	0 2 3	0 4 6
Do. do. (planks and boards)	0 2 0	0 7 6
Italian, per foot superficial	0 0 3	0 0 7½
Black Sea, per ton	6 0 0	12 0 0

* The prices named are for the wood as imported and landed in the docks. Ten per cent., approximately, should be added in order to arrive at the current trade prices.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Sewerage and Water Supply	Hay (Brecknock) R.D.C.	25*l.*	Aug. 28
Plans for Schools	Northfleet Sch. Bd.	15*l.* 15s.	Sept. 4
Town Hall	Borough of Workington	40*l.*; 20*l.*; and 10*l.*	Sept. 15
Public Library	Dumfries and Maxwelltown T.C.	Not stated	do.
Bank, Norwich (Local Competition)	Directors of Norfolk & Norwich Savings Bank	50 gns.; 20 gns.; & 10 gns.	Sept. 16
Designs in Tunbridge Ware	Tunbridge Wells Tech Education Com.	3 gns.; 2 gns.; 1 guinea	Sept. 30
*New Public Market	Bd. of Public Wks. for Island of New Providence, Bahamas, West Indies	40*l.* 10*l.* 5*l.*	Nov. 30.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Sewerage Purification Works	Adlington (Lancs.) U.D.C.	T. S. McCallum, C.E. 52, Corporation-st. Manchester	Aug. 19
Union Offices, &c. Compton-street	Ashbourne Union	Naylor & Sale, Archt. Irongate, Derby	do.
Painting Work, Commercial-rd.	Wolverhampton Corp.	J. W. Bradley, C.E. Town Hall	do.
Bridge over Far Stock, Dean	Cockermouth R.D.C.	J. B. Wilson, C.E. Courtbldgs. Cockermouth	do.
Cellars, Subway, &c. Union-street Brewery, Trowbridge	J. H. & H. Blake, Ltd.	W. H. Stanley, C.E. Trowbridge	do.
Glider Bridge, Clough Bottom	Bury (Lancs.) Corp.	J. Cartwright, C.E. Boro. Engr.	do.
Bridge Steelwork, Abercynon	Glamorgan C.C.	T. M. Franklen, County Offices, Cardiff	do.
Volunteer Drill Hall, Doncaster	.....	J. E. Knight, Archt. 33, College-st. Rotherham	do.
Asphalt Work, Sewers, &c.	Dronfield Sch. Bd.	W. J. Siddall, Archt. Hope-terrace, Dronfield	do.
Steamboat Slip, Loch Katrine	Glasgow Corp.	J. M. Gale, Engr. 45, John-st. Glasgow	do.
Hotel, Caerphilly	.....	E. M. Bruce - Vaughan, Archt. Cardiff	do.
Additions to Workhouse Offices	New Ross (Ireland) Union	P. A. Pope, Union Offices, New Ross	do.
Cellars, &c. Eagle Brewery, Wakefield	.....	S. Jackson & Son, Archt. Tanfield-chambers, Bradford	do.
Printing Offices, &c. High-st. Berwick	H. R. Small	J. L. Miller, Archt. 39, Hide-hill, Berwick-on-Tweed	do.
Houses and Offices, Ropery-lane, Greens, Berwick	R. Aird	do.	do.
Sewerage Works	Macroom (Ireland) R.D.C.	J. T. Murphy, Council Offices	do.
Additions to Hapstead House, Buckfastleigh, Devon	.....	Michelmore & Son, Archt Totnes	do.
Additions to Rectory, Taughboyne, Churchtown, Ireland	.....	A. M'C. Stewart, Archt. Shipquay-st. Londonderry	do.
Four Houses, Wickham Market, Suffolk	.....	C. D. Castell, Wickham Market	do.
Decorating Room, &c. Town Hall	Portsmouth T.C.	The Town Clerk, Town Hall, Portsmouth	Aug 20
Town Sewerage Works	Leigh-on-Sea U.D.C.	Bailey-Denton, Son, & Lawford, Palace-chambers, Westminster	do.
Technical Schools and Fire Station	Southend Corp.	W. A. Snow, Town Hall	Aug. 21
Electrical Work in Tramcars	Blackpool Corp.	R. C. Quin, Engr. Electricity Works, Blackpool	do.
Sewerage Works, &c. (7,300 yards)	Leigh-on-Sea (Essex) U.D.C.	Bailey-Denton & Co. Engrs. Palace-chmbrs. Westminster, S.W.	do.
Seamen's Bethel, Falcon-st. Workington	Committee	W. G. Scott & Co. Archt. Victoria-bldgs. Workington	do.
Granite Road Metal	Stevenage U.D.C.	W. O. Times, Council Offices	do.
Electric Light Buildings, West Strand	Whitehaven Corp.	Boro. Engr. Town Hall	do.
Factory, Hertford	Gilbertson & Page, Ltd.	J. Farley, Archt. Hertford	do.
Boiler House and Shaft at Workhouse	Bradfield Union	R. Simmons, 4, Bridge-st. Caversham, Reading	do.
Electricity Meters, &c.	Glasgow Corp.	W. A. Chamen, Engr. 75, Waterloo-st. Glasgow	do.
Sewer, Ffriddoedd-road	Bangor Corp.	J. Gill, C.E. Boro Surv. Bangor	do.
Post Office, Enniskillen	.....	Office of Public Works, Custom House, Dublin	do.
Office, &c. Kirkstall Abbey	Leeds Corp.	H. Walker, Archt. 8, Upper Fountaine-st. Leeds	do.
Granite Road Metal	Barnet U.D.C.	H. W. Poole, 40, High-st. Barnet	do.
Roads and Sewers, Ely Station	Glam. C.C.	David & David, 27, High-st. Cardiff	do.
Road Works, Whinfell	Cockermouth R.D.C.	J. B. Wilson, C.E. Courtbuildings	do.
Street Works, Ravensthorpe, Yorks.	.....	C. H. Marriott & Son, Surv. West Park-street, Dewsbury	do.
Chapel, Staton Rose, near Pocklington, Yorks.	.....	G. F Danby, Archt. 10, Park-row, Leeds	do.
Block of Cottages, Amberley, Sussex	Pepper & Son	H. Howard, Archt. Town Offices, Littlehampton	do.
Four Houses, Mablethorpe	Mablethorpe & Sutton (Lincs.) Gas Co.	R. Day, Vernon-rd. Bridlington Quay	do.
House, Cross Hills, Yorks.	.....	J. Istirk, Archt. Hortonrd. Bradford	do.
Enlargement of School, Tyersal	Bradford Sch. Bd.	E. P. Peterson, Archt. 48, Sunbridge-rd. Bradford	do.
Shop Fittings, &c. Hornby-st. Bury	.....	D. Hardman, Archt. Silver-st. Bury	do.
Alterations to Lowe Bank, Esperley-lane, nr. Cockfield, Durham	.....	W. Parkin, Surv. Barnard Castle	Aug. 22
Sewer Bricks, Egremont	Wallasey U.D.C.	Engineer, Council Offices, Egremont	do.
Boiler, Pumps, Dynamo, &c.	Colwyn Bay U.D.C.	W. Jones, C.E. Council Offices	do.
Underground Convenience, Poultry Market	Manchester Corp	City Surv. Town Hall, Manchester	do.
C.I. Pipes	Bury (Lancs.) Corp.	J. Cartwright, C.E. Town Hall	do.
Steel Rails, &c.	Darwen Corp.	Boro. Electrical Engr. Town Hall	do.
Street Works, Threlfall-road, &c.	Blackpool Corp.	J. Wolstenholme, Boro Engr. Town Hall	do.
Synagogue, Reading	Hebrew Congregation	Mr. Lewton, Archt. 6, Forbury, Reading	do.
Church of All Hallows, Easton, Bristol	.....	G. H. Oatley, Archt Edinburgh-chmbrs, Bristol	do.
Drainage Works	Droitwich Union	C. Stevens, Surv. Workhouse, Droitwich	do.
Granite Setts, &c.	Darwen Corp.	Boro Engr. Town Hall	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Church and School, Bishopston, Bristol	.....	Drake & Pizey, Archt. Bank-chmbrs. Baldwin-st. Bristol	Aug. 22
Paving, Flagging, &c.	Guisborough U.D.C.	B. Dunning, Surv. Fountain-st. Guisborough	do.
Eight Bacterial Filter-beds, &c.	Berkhampstead and Northchurch Sewage Disposal Works	J. Lemon, 9, Victoria-st. Westminster	Aug. 23
Thirteen Houses, Adelaide-street	Clayton-le-Moors Co-op. Soc.	J. W. Cooper, Society's Offices, Clayton	do.
Offices	Dowlais Iron Co.	E. A. Johnson, Archt. Merthyr	do.
Kerbing, Channelling, &c. Footpaths, Royston	Herts C.C.	County Surv. 41, Parliament-st. Westminster, S.W.	do.
Pipes, &c.	Southport Corp.	R. P. Hirst, Boro. Surv. Town Hall	do.
Drainage Works	Congleton Common Land Trustees	C. K. Hall, Surv. 1, Westst. Congleton	do.
School, Cardendan, Fife	Auchterderran School Board	Lyle & Constable, Archt. 3, Hill-st. Edinburgh	do.
Platform Shed, Londonderry	Donegal Ry. Co.	J. Barton, Engr. Exchange-bldgs. Dundalk	do.
Electrical Overhead Line Equipment	Dundee T.C.	W. H. Tittensor, Elec. Engr. Dudhope-crescent-road, Dundee	do.
Drainage Works, Crumpsall	Manchester Union	Mills & Murgatroyd, Archt. 23, Strutt-street, Manchester	do.
Rebuilding Green Tree Inn, Bishop Auckland	.....	F. H. Livesey, Archt. Newgate-st. Bishop Auckland	do.
Additions to North School	Coldstream (N.B.) Sch. Bd.	Melrose & Porteous, Coldstream	do.
Shops and Houses, High-street, Rawmarsh	W. Willey	J. Platts, Archt. High-st. Rotherham	do.
Sewers	Belfast Corp.	City Surv. Town Hall	do.
Water Tower, Steel and Cast-iron Works, and Brickwork, &c. at Milton	West Hampshire Water Works	R. St. Geo. Moore, 17, Victoria-st. Westminster	Aug. 24
Sewerage Works	Plymouth Corp.	J. Mansergh, 5, Victoria-st. Westminster	do.
Sale Shops and Converting Premises	Rotherham Corp.	J. Platts, Archt. High-st. Rotherham	do.
Reservoirs, Oldpark	Belfast Water Commrs	B. Hamilton, Water Office, Belfast	do.
Street Works, Tatton-road South	Heaton Norris U.D.C.	J. G. Banks, 79, Heaton Moor-road, Heaton Norris	do.
Refreshment House, Gibbet-lane, Halifax	.....	R. Horsfall & Son, archt. 22a, Commercial-street, Halifax	do.
Additions to Workhouse Infirmary	Salisbury Union	J. Harding & Son, archt. 58, High-street, Salisbury	do.
Wesley Central Hall, Portsmouth	.....	J. J. Green, archt. South John-street, Liverpool	do.
Schools, Swaffham, Norfolk	.....	Milne & Hall, archts. 77, Chancery-lane, W.C.	do.
Additions to Broomfield House, Dewsbury	.....	F. W. Ridgway, archt. Dewsbury	do.
Road Works, Damory Court Estate, Blandford	.....	C. Hunt, Archt. Blandford	Aug. 25
Latrine and W.C. Accommodation	Kensington & Chelsea Sch. Dist.	Cecil Sharpe, 11, Old Queen-st. S.W.	do.
Repairs and Painting Works, &c. at Baths, Whitfield-street, W.	Vestry of St. Pancras	C. H. F. Barrett, Vestry Hall, Pancras-rd. N.W.	do.
Wesleyan Church and Schools, Shoreham, Sussex	.....	Gordon, Lowther & Co. Archt Finsbury House, Blomfield-st. E.C.	do.
Cottages	Calbridge (Ireland) Union	Union Archt. 33, Kildare-street, Dublin	do.
House and Shop, Shoeburyness	.....	W. Y. Hobbiss, Archt. 57, High-street, Southend	do.
Sewage Works, Lees	Oldham U.D.C.	Blackburne & Co. Engr. 54, Union-street, Oldham	do.
Steel Girder Rails (2,000 tons), &c.	Bradford Corp.	J. H. Cox, Engr. Town Hall	Aug. 24
Granite Setts (5,000 tons)	do.	do.	do.
Road Works	Glenties (Donegal) R.D.C.	A. Hill, Board Room Glenties	do.
Wood Paving Blocks	Bradford Corp.	J. H. Cox, City Surv. Town Hall	do.
Bridge Piers, &c. Dalston, Cumberland	Carlisle R.D.C.	G. Armstrong, Archt. 24, Bank-street, Carlisle	do.
Lodge, near Canterbury	Cnartham P.C.	A. Bromley, Archt. Cathedral Precincts, Canterbury	do.
Police Station, Luton	Bedfordshire C.C.	County Surv. Shire Hall, Bedford	do.
Hotel, Wooda Bay, near Barnstaple	.....	G. C. Smyth-Richards, Surv. Barnstaple	do.
Paving, James-street	Devonport T.C.	J. F. Burne, Boro Surv. Town Hall	do.
New Municipal Buildings and Alterations of Public Hall	Borough of Godalming	Lanchester, Stewart, & Rickards, 1, Vernon-place, Bloomsbury-sq.	Aug. 28
Water Mains, &c.	East Ashford R.D.C.	Bailey-Denton & Co. Engr. 9, Bridge-st. S.W.	do.
Sewage Disposal Works, Westbury-on-Trym	Barton Regis R.D.C.	A. P. J. Cotterell, C.E. 7, Baldwin-st. Bristol	do.
New Board Schools and Swimming Bath	Chesterfield Sch. Bd.	Tiltman & Jackson, Archt. 29, Knifesmith-gate, Chesterfield	do.
Road Works	Stranorlar (Ireland) R.D.C.	G. M'Laughlin, Council Offices	do.
Dynamos, Electric Mains, &c.	Perth Commrs.	W. U. C. Hawtayne, Elec. Engr. 9, Queen-st.-pl. E.C.	do.
Extension of Electricity Works	Halifax County Boro Council	W. H. D. Horsfall, Archt. Silver-street, Halifax	do.
Sewage Works, Ashstead	Epsom R.D.C.	Beesley & Co. 11, Victoria-street, S.W.	Aug. 29
Street Works	Stanley (Durham) U.D.C.	J. Routledge, Surv. Council Offices	do.
Paving, Scott Park-road	Burnley Corp.	Boro Surv. Town Hall	do.
Paving, Sandhurst-road, &c.	Bedford U.S.A.	T. S. Porter, Town Hall	do.
Street Works, Back Murray-street, &c.	Stanley (Durham) U.D.C.	J. Routledge, Surv. Council Offices	do.
Sanatorium	Malvern U.D.C.	W. Lambert, Council Offices	Aug. 30
Service Reservoir, &c.	Westbury (Wilts), &c. R.D.C.	W. H. Stanley, C.E. Trowbridge	do.
Sewage Purification Works	Morley Corp.	W. E. Putman, C.E. Town Hall	do.
Underground Convenience, Market-place, Enfield Town	Enfield U.D.C.	R. Collins, Surv. Council Offices	do.
Sewerage Works, John-street	Hebburn U.D.C.	J. R. Benton, Surv. Council Offices	do.
Repairs, &c. to Chimney Stacks, Fulham-road, West Brompton	St. George's Union	E. T. Hall, Archt. 57, Moorgate-street, E.C.	do.
Bridge Works, Halesowner	Worcestershire C.C.	J. H. Garrett, Road Surv	do.
Blue Brick Paving, &c.	do.	Shirehall, Worcester	do.
Laundry Buildings, &c. Mount Gould-road	Plymouth Corp.	G. D. Bellamy, C.E. Courtenay-st. Plymouth	Aug. 31
Workmen's Dwellings	Sunderland Corp.	Boro Surv Town Hall Sunderland	do.
Electric Batteries, &c.	Battersea Vestry	Prof. A. B. W. Kennedy, 17, Victoria-st. S.W.	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. x, *&* xix. *Public Appointments, pp.* xvi. xvii. *&* xix.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Sewerage Works, Capelulo	Penmaenmawr, U.D.C.	E. Worrall, Surv. Council Offices	Aug. 31
Sunday School, &c. Woodsley-road, Leeds	.....	G. F. Danby, Archt. 10, Park-row, Leeds	do.
Warehouse, &c. Poland-street	Manchester Corp.	J. Swarbrick, Archt. 33, Brazennose-st. Manchester	do.
*New Office, Broad-street, Bristol	Corporation of Bristol	T. H. Yabbicon, 63, Queen-sq. Bristol	Sept. 1
Reservoir (17,000,000 gallons)	Carmarthen Corp.	Boro Surv. Town Hall	Sept. 2
Sanitary Coveniences	Windsor T.C.	Boro Surv. Helena-road, Windsor	do.
Widening Dock Entrance, Spencer Dock	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engr. Belfast	Sept. 4
*New Asylum	East Sussex Visiting Committee	G. T. Hine, 35, Parliament-street, S.W.	do.
*Sewering of the Village of Sonning	Wokingham R.D.	R. W. Hamilton, 56, Hamilton-rd. Reading	do.
Sewerage Works, Cobb	Lyme Regis T.C.	Town Clerk, Lyme Regis	do.
Technical Institute	Padiham U.D.C.	H. Ross, Archt. Cannon-street, Accrington	do.
Block of Schools at Chase Side, Enfield	Enfield Sch. Bd.	G. E. T. Laurence, 181, Queen Victoria-st, E.C.	Sept. 5
*New Wesleyan Church	.....	Gordon, Lowther, & Gunton, Finsbury House, Blomfield-street, E.C.	Sept. 6
Sewerage Works, &c. Egmont-road	Sutton (Surrey) U.D.C.	C. C. Smith, Surv. Council Offices	do.
Steel rails, &c. for Tramways	Waterloo (Lancs.) U.D.C.	F. S. Yates, C.E. Town Hall, Waterloo	do.
*Five Blocks of Buildings	County Borough of Devonport	The Borough Surv. 30, Kerst. Devonport	Sept. 7
Coastguard Station, Ballycrovane, Co. Cork	.....	H. Williams, Office of Public Works, Dublin	do.
Coastguard Buildings, Cromarty, N.B.	Admiralty	Director of Works, 21, Northumberland-av. W.C.	Sept. 8
Intermediate School, Rhyl	.....	J. R. Jones, 4, Brighton-road, Rhyl	Sept. 9
Electric Light and Traction Plant	West Ham U.D.C.	W. C. Ullmann, Elec. Engr. White Post-lane, East Ham	do.
River Bridge, Walton-le-Dale	Lancs. C.C.	W. H. Radford, Engr. County Offices, Preston	Sept. 11
Asylum Superstructure	Croydon Corp	Boro Engr. Town Hall	Sept. 12
Surveyor's Materials	Croydon R.D.C.	J. Wilson, Town Hall	Sept. 13
*Distribution Works	Corp. of Birmingham	Jas. Mansergh, 5, Victoria-street, Westminster	Sept. 14
*Block of Schools	Enfield School Board	G. E. L. Laurence, 181, Queen Victoria-st. E.C.	Sept. 15
Cottage Hospital, Hallwill, Devon	.....	C. F. A. Voysey, Archt. 6, Carlton-hill, N.W.	Sept. 30
*Offices and Warehouse	.....	C. P. Ayres, 14, High-st. Watford	No date
*Kentish Rag Stone	.....	Alex. Penney & Co. 107, Fenchurch-street, E.C.	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Alterations to Premises, Selby	Yorks. Banking Co.	J. Young & Co. Archt. 62, Market-street, Bradford	No date
House, Halton, nr. Leeds	.....	A. E. Dixon, Archt. 5, Park-lane, Leeds	do.
Flagging (1,000 yards), Bradford	.....	J. Jackson, Archt. Barry-street, Bradford	do.
Dynamos, Street Wiring, &c. Kendal	Ingleton Elec. Light Co.	G. Gilkes & Co. Canal Ironworks, Kendal	do.
Works, Littleborough	Phœnix Ironworks Co.	F. H. Shuttleworth, Archt. Littleborough	do.
Wesleyan Chapel, Barwell, Leicester	.....	A. E. Sawday, Archt, 4, Market-st. Leicester	do.
House, nr. Tunbridge Wells	.....	J. F. Bull, Surv. 30, Bedford-row, W.C.	do.
Mills, Maidstone	W. J. Mackey	H. Bensted, Archt. Maidstone	do.
*Two Blocks of Flats (Tooting)	.....	Theobald, 26, Budge-row, Cannon-street, E.C.	do.
Warehouse, The Close, Newcastle-on-Tyne	Spiller & Baker	Oliver & Co. Archt. Mosley-street, Newcastle-on-Tyne	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
General Foreman	Walthamstow U.D.C.	3*l.* per week	Aug. 21
Builder's Clerk	do.	30*s.* per week	do.
Architectural Draughtsman	County Surv. Northallerton	3 gns. per week	Aug. 22
Building Inspector	Acton D.C.	2*l.* per week	do.
*Architectural Assistant	County Boro' of Bury	130*l.* for first year, rising to 150*l.* by annual increments	Aug. 25
*Drainage Inspector	Plumstead Vestry	3*l.* 3*s.* per week	Aug. 26
*Draughtsman	do.	2*l.* 10*s.* per week	do.
*Steam Roller Driver	do.	37*s.* per week and allowance	do.
Clerk	Wandsworth Board of Works	30*s.* per week, rising to 2*l.*	Aug. 28
*Road Foreman	Twickenham U.D.C.	2*l.* 10*s.* per week	do.
*Superintendent of Work's Dept.	Vestry of St. Mary, Battersea	260*l.* rising to 300*l.* per annum	Aug. 30
*Sanitary Inspector	Camberwell Vestry	117*l.*	Sept. 6

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. x. & xix. *Public Appointments, pp.* xvi. xvii. & xix.

PRICES CURRENT—*continued.*

	£	s.	d.	£	s.	d.
Satin Walnut (logs) per foot cube	0	1	0	0	1	3
,, (planks and boards)	0	2	0	0	2	9
Sequoia (Californian redwood), per foot cube	0	1	9	0	2	0
Whitewood, American (logs)	0	1	3	0	1	6
,, ,, (planks and boards)	0	1	6	0	2	9
Quartered oak ,, ,, ,,	0	2	3	0	4	0
Kauri pine (logs)	0	1	9	0	2	0
,, ,, (planks)	0	2	3	0	2	9
Jarrah (planks)	0	2	3	0	2	6
Lancewood spars each, fresh and large	0	5	0	0	8	0
Lancewood spars, ordinary to fair	0	4	0	0	5	0
Degame spars	0	8	0	0	10	6
METALS.						
IRON—Pig, in Scotland ton	3	6	10	0	0	0
Bar, Welsh, in London	6	0	0	6	5	0
Do. do. at works in Wales	5	15	0	5	17	6
Do. Staffordshire, in London	6	5	0	7	10	0
COPPER—British cake and ingot	80	0	0	80	10	0
Best selected	80	10	0	81	0	0
Sheets, strong	85	0	0	86	0	0
Chili bars	75	18	9	0	0	0
YELLOW METAL lb.	6¾d.			7¼d.		
LEAD—Pig						
Spanish ton	15	0	0	0	0	0
English Com. Brands	15	5	0	0	0	0
Sheet, English, 6 lbs. per sq. ft. and upwards	16	5	0	0	0	0
Pipe	16	15	0	0	0	0
ZINC—English sheet ton	29	0	0	0	0	0
Vieille Montagne	30	0	0	0	0	0
Spelter	24	15	0	25	0	0
TIN—Straits	143	10	0	0	0	0
Australian	143	10	0	144	0	0
English Ingots	146	0	0	147	0	0
Banca	0	0	0	0	0	0
Billiton	0	0	0	0	0	0
OILS.						
Linseed ton	21	2	6	0	0	0
Cocoanut, Cochin	29	5	0	0	0	0
Do. Ceylon	25	15	0	0	0	0
Palm, Lagos	24	0	0	0	0	0
Rapeseed, English, pale	23	10	0	0	0	0
Do. Brown	22	0	0	0	0	0
Cottonseed ref.	17	15	0	18	15	0
Oleine	17	5	0	19	5	0
Lubricating U.S.	0	5	9	0	7	9
Do. Black	0	5	0	0	6	0
TAR—Stockholm barrel	1	6	6	0	0	0
Archangel	1	0	0	0	0	0
Turpentine	36	10	0	0	0	0

TO CORRESPONDENTS.

G. T. H. (If you send us your address, we will let you have a reply to your question).—G. B. (Below our limit).

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BASINGSTOKE. — For sewer extension works, Cliddesden-road, for the Town Council. Mr. G. Fitton, Borough Surveyor, Town Hall, Basingstoke :—

Collier & Catley, St. Mary's Butts, Reading .. £227

CHADWELL HEATH.—For alterations and additions to the "Greyhound" public-house, Chadwell Heath, Essex, for Messrs. Goodey. Mr. Henry Poston, architect, 39, Lombard-street :—

Brown & Kruse	£1,355	Todd & Co.	£1,200
Chas. Blyton	1,280	A. E. Symes	1,071

GATESHEAD.—For the execution of paving works, &c., West Park-road, for the Corporation. Mr. J. Bower, Borough Surveyor, Town Hall, Gateshead :—

Wm. Cumming.	£790 13 11	G. E. Simpson, Newcastle*	£782 7 4

GRAYS (Essex).—For the erection of cottage homes for the Whitechapel Guardians. Mr. Christopher M. Shiner, architect, 3, Bond-court, E.C. Quantities by Mr. G. Silvester :—

Barker & Co., Ltd.	£15,678	Rons	£14,600
W. Potter	15,500	Brown	14,480
Minter	15,300	Hammond	14,175
Wall	14,790	Davey	12,999
G. Sharp	14,750		

HARROW.—For the supply of granite road metal (1,000 tons), for the Urban District Council. Mr. Edgar Lines, Surveyor, Council Offices, Harrow :—

The Enderby and Stoney Stanton Granite Company, Narborough, nr. Leicester.*

	s.	d.	
1½-in. granite at	12	6	per ton.
2-in. ,,	12	0	,,
1-in. granite chippings at	8	6	,,
¾-in. ,, ,,	8	0	,,

LEAMINGTON.—For the erection of school residence, North End, for the Burton Dassett School Board. Mr. F. P. Trepess, architect, 8, Jury-street, Warwick. Quantities by the architect :—

J. F. Booth	£729 0	J. Walters	£575 15
F. Harris	695 0	T. Fleming, Gaydon*	560 0
W. H. Ralphs	590 0		

LITTLE ILFORD.—For the erection of new house and shop, Sixth-avenue, Little Ilford, Essex, for Messrs. Savill Bros., Limited. Mr. Henry Poston, architect, 39, Lombard-street, E.C. :—

G. J. Hosking	£1,823	Todd & Co.	£1,747
W. Gladding	1,788	Blyton & Sons	1,707

LONDON.—For the erection of new stables at the Fulham depôt, for the London Parcels Delivery Company, Limited. Mr. Henry Poston, architect, 39, Lombard-street, E.C. :—

Killby & Gayford	£985	Todd & Co.	£963
Hall, Beddall, & Co.	970	Burman & Sons	950

LONDON.—For rebuilding the "Farrier's Arms" public-house, High-street, Stratford, E., for Mr. James Holden. Mr. Henry Poston, architect, 39, Lombard-street. Quantities by Mr. Henry Theobald, 48, Finsbury-pavement, E.C. :—

Todd & Co.	£1,894	Gregar & Son	£1,592
Blyton & Sons	1,860	J. & H. Cocks	1,549
A. E. Symes	1,853		

LONDON.—For alterations, &c., at No. 57, Russell-square, W.C., for Mr. J. H. Lile. Mr. W. Ernest Hazell, architect, 23, Moorgate-street, E.C. :—

Clarke & Mannoch	£1,690	Stevens Bros.	£1,396
Bristow & Sons	1,584	West Bros.	1,380
C. W. Patten	1,565	Norris & Sons*	1,306

LONDON.—For pulling down and re-erecting "Eastern Star" beer-house and cottage adjoining, Brunswick-road, Poplar, E., for Mr. H. J. Harrison. Messrs. Bradshaw, Brown, & Co., architects and surveyors, Billiter-square-buildings, E.C. :—

Chafen & Newman	£2,187 0 0	T. H. Jackson	£1,891 0 0
F. & T. Thorne	2,135 0 0	S. Haylett	1,686 10 0
Harris & Wardrop	1,950 0 0	Watts, Johnson, & Co.	1,642 0 0
		Bruce & Croom*	1,452 9 6

LONDON.—For new warehouse and workshops at 8, George's-square, Hoxton, N., for Miss Rosa M. Langmore. Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W. Quantities by Mr. Gilbert W. Booth, F.S.I., 3, Adelaide-street, Charing Cross, W.C. :—

Vears & Co.	£2,719	Woodward & Co.	£2,250
Lorden & Sons	2,444	Walter Wallis	2,197
Wilkinson Bros.	2,383	William S. Beaton*	2,109

LONDON.—For proposed new depôt at Forest Gate, E., for the London Parcel Delivery Company, Limited. Mr. Henry Poston, architect, 39, Lombard-street, and Forest Gate :—

—	Stables, and Warehouse, &c.	Boundary Wall.	Road Approach.	Total.	Credit Ballast.	Net Total.
	£	£	£	£	£	£
Kilby & Gayford	5,027	169	333	5,529	100	5,429
G. J. Hosking	5,039	147	358	5,544	130	5,414
Hall, Beddall, & Co.	4,980	120	385	5,485	80	5,405
Mowlem & Co.	4,790	130	363	5,283	114	5,169
Todd & Co.	4,709	142	326	5,177	90	5,087
Blyton & Sons	4,460	105	295	4,860	70	4,790*
Architect's estimate	4,600	100	300	5,000	100	4,900

LONDON.—For additions, alterations, and new billiard room to Dunkeld, Arkwright-road, N.W., for Mr. D. J. Mackay. Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W. Quantities by Mr. Gilbert W. Booth, F.S.I., 3, Adelaide-street, Charing Cross, W.C. :—

Vears & Co.* £2,338

[*See also next page.*

LONDON.—For the Camden Theatre, High-street, Camden Town, N.W., for Messrs. the Camden Theatre, Limited. Mr. W. G. R. Sprague, architect, Fitzalan House, Arundel-street, W.C. Quantities by Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W. :—

Leslie & Co.	£29,325	F. & H. F. Higgs	£26,500
MacCormick & Sons	28,765	Patman & Fothering-ham	26,465
Courtney & Fairbairn	28,500	Wilkinson Bros.	26,400
Howell J. Williams	28,275	Kirk & Randall	26,336
Scrivener & Co.	27,700	Lorden & Sons	26,245
C. F. Kearley	27,196	Walter Wallis‡	25,858
Harris & Wardrop	26,597		

‡ Amended and accepted, £25,000.

LUTON.—For the execution of private improvement works, Charles-street and St. Ann's-road :—

Charles-street.

T. Free & Sons £1,085 0
The Patent Victoria Stone Company, Bishopsgate-street, Without* 1,080 7
[Surveyor's estimate ..... £975].

St. Ann's-road.

T. Free & Sons, Maidenhead* £397 15 6
[Surveyor's estimate ..... £336].

NEWTON ABBOT.—For building reservoir, laying three miles water main, &c., for the Rural District Council. Mr. R. A. Rogers, surveyor, Union-street, Newton Abbot :—

Bell & Co.	£2,889	G. Hicks	£2,175
Mingo & Boone	2,776	Hawkings & Best, Teignmouth*	2,064
F. Drake	2,520	J. C. Adams	2,080
Burden & Co.	2,500	E. S. Ford	2,050
W. C. Shaddock	2,348		
E. Pike	2,345		

PONTEFRACT.—For the erection of two villas, Featherstone, for Mr. J. Shaw. Messrs. Garside & Pennington, architects, Pontefract :—
Walker & Ward, Mill Hill, Pontefract* £500

ST. ANDREWS (N.B.).—For additions to farmhouse, &c., Prior-Letham, for Governors of the Madras College, St. Andrews. Mr. David Henry, architect, St. Andrews. Quantities by architect :—

Masonry.—T. Johnson, St. Andrews*	£154	0	0
Joinery.—J. Wallace, Cameron St. Andrews*	82	17	0
Plumbing.—J. Farquharson, St. Andrews*	65	15	0
Slating.—Rintoul & Mackie, St. Andrews*	14	9	6
Plastering.—Andrew Scott, St. Andrews*	35	0	0
Water Supply.—Maclellan & Co., Limited, Glasgow*	70	10	0
Total	£423	1	6

SUTTON-IN-ASHFIELD.—For the erection of school buildings, for the School Board of Sutton-in-Ashfield. Mr. J. P. Adlington, architect, Sutton-in-Ashfield. Quantities by the architect :—

Brown & Son	£10,800	F. Lee	£9,450
J. F. Price	10,439	H. Shaw, Sutton-in-Ashfield*	9,140
J. Hutchinson	9,720		

WEST BRIDGFORD (Notts).—For laying sewer and drain, Chaworth-road. Messrs. Sands & Walker, engineers, Angel-row, Nottingham :—
Bower Bros., West Bridgford* £520

TENDRING.—For the erection and completion of the new infirmary, nurses home, &c., on the grounds adjoining the present union workhouse. Mr. Frank Whitmore, architect, Chelmsford :—

Shillitoe	£13,250	E. West	£10,937
Smith & Son	11,675	F. Thurman, Walton, near Ipswich*	10,799
E. Saunders	11,500		
F. Bennett	11,175		

WOLVERHAMPTON.—For pulling down Wesleyan church and erecting new buildings, Darlington-street. Mr. A. Marshall, architect, King-street, Nottingham :—

Henry Gough	£14,340	Cave & Sons	£12,900
Williamson & Co.	13,940	Willcock & Co.	12,450
T. Barlow	13,599	F. Lindsay Jones, Wolverhampton*	12,229
F. & S. Hum	13,460		
Fist & Sons	13,383		

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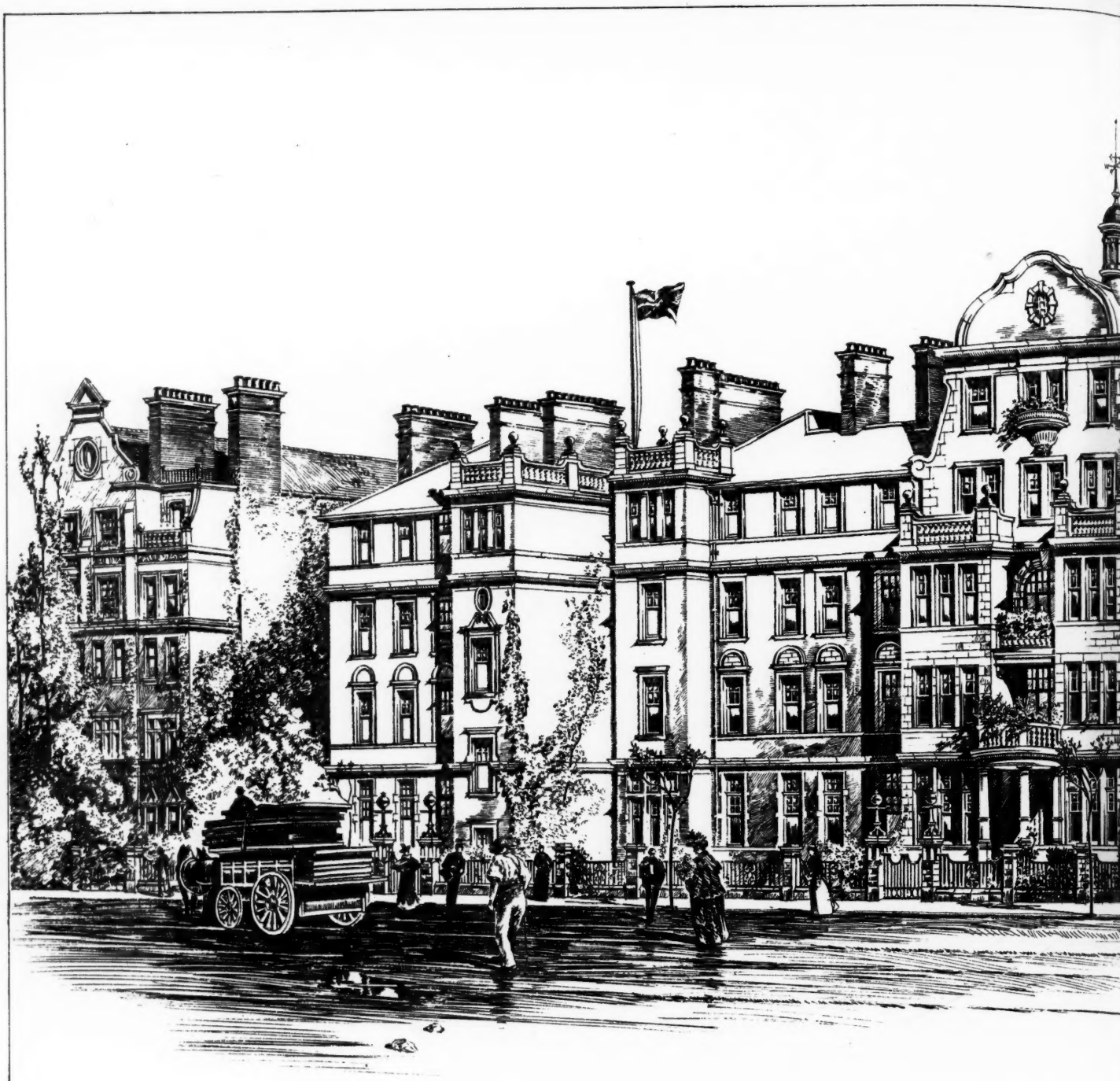

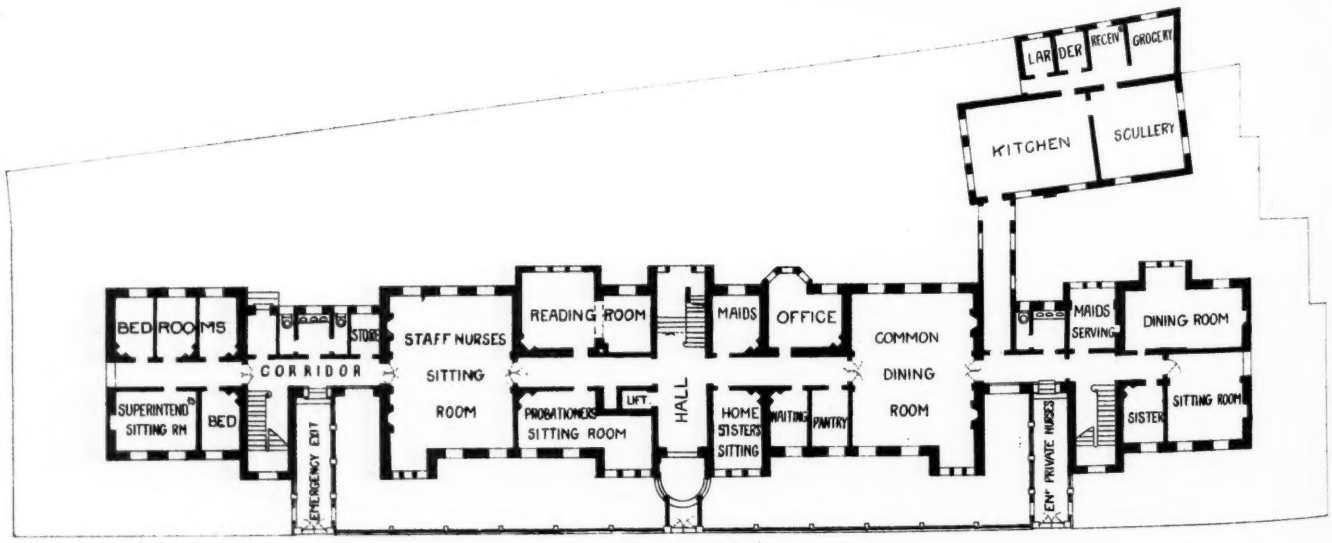

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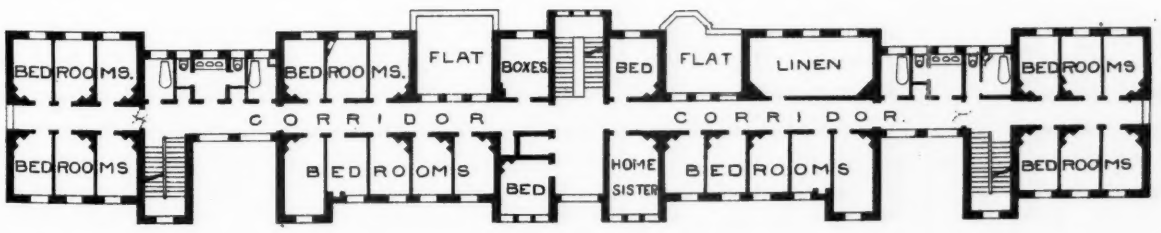

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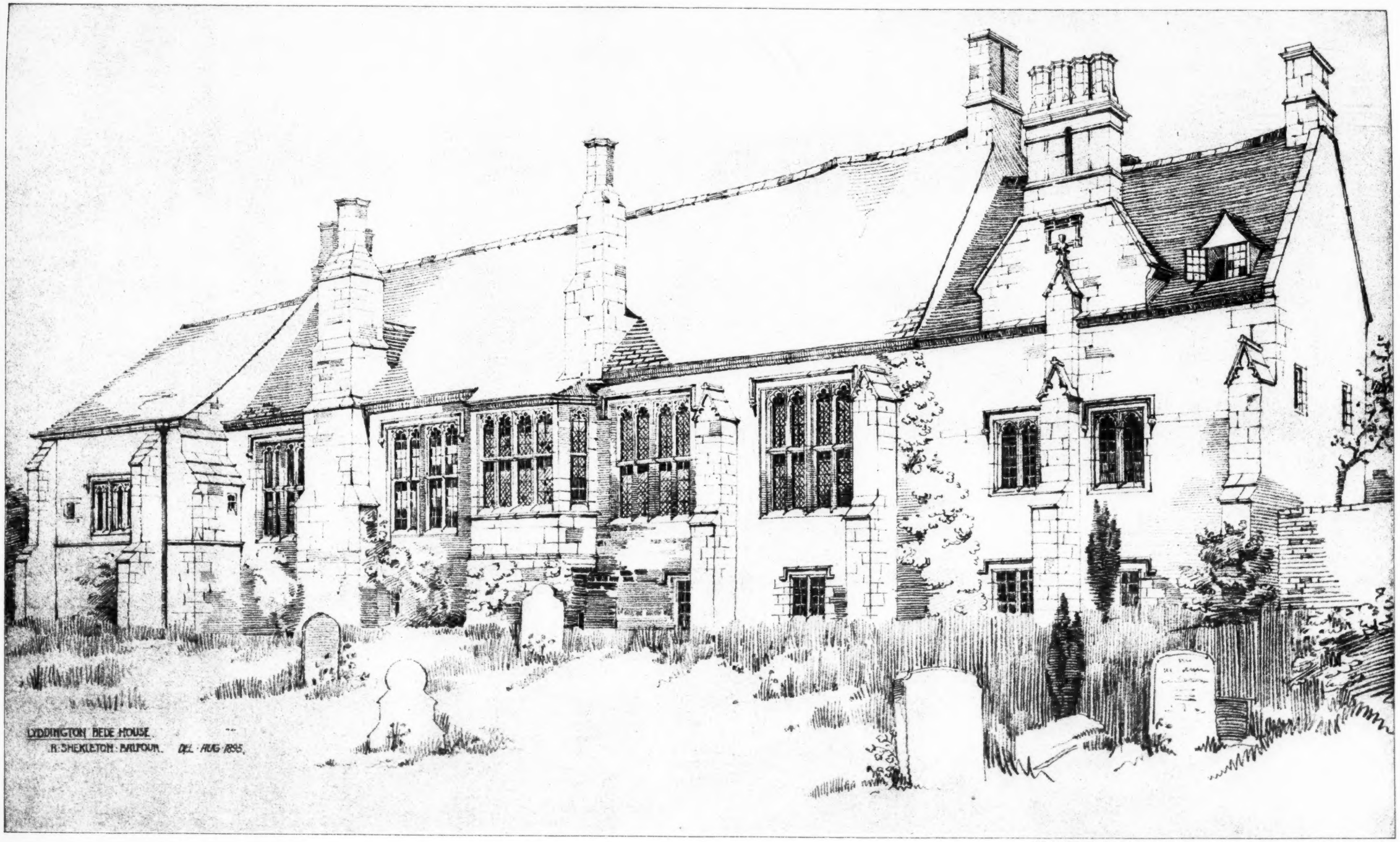

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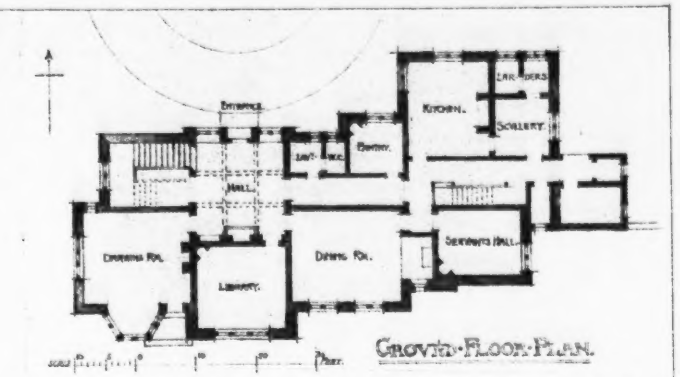

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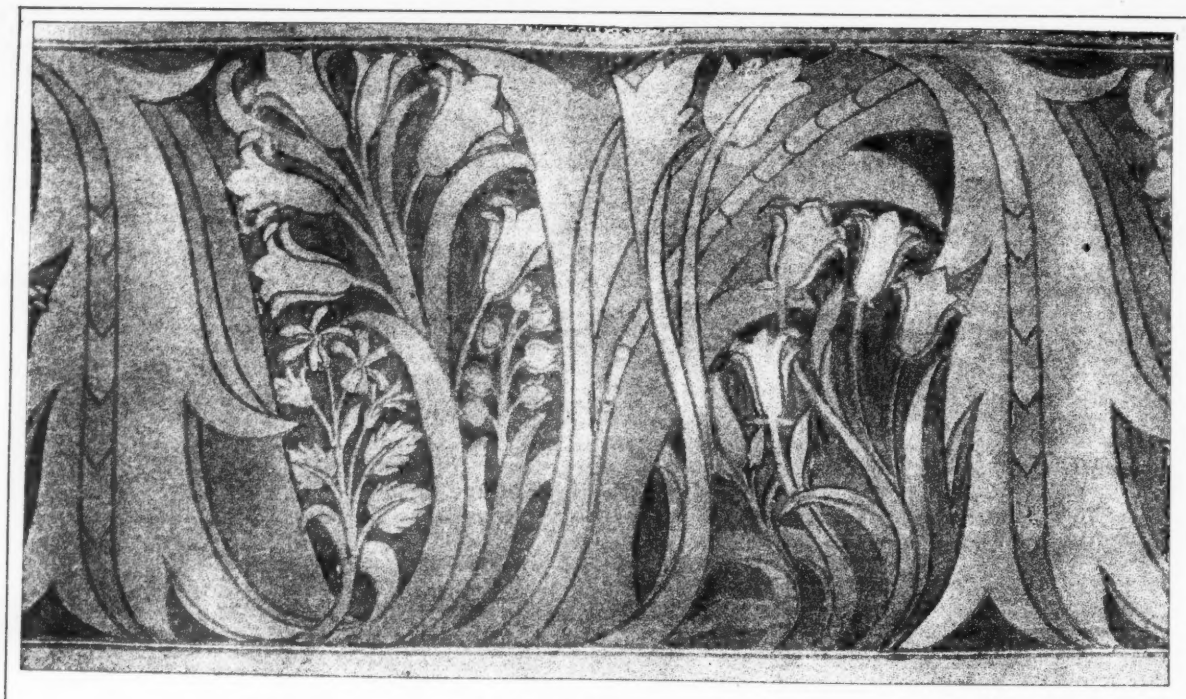

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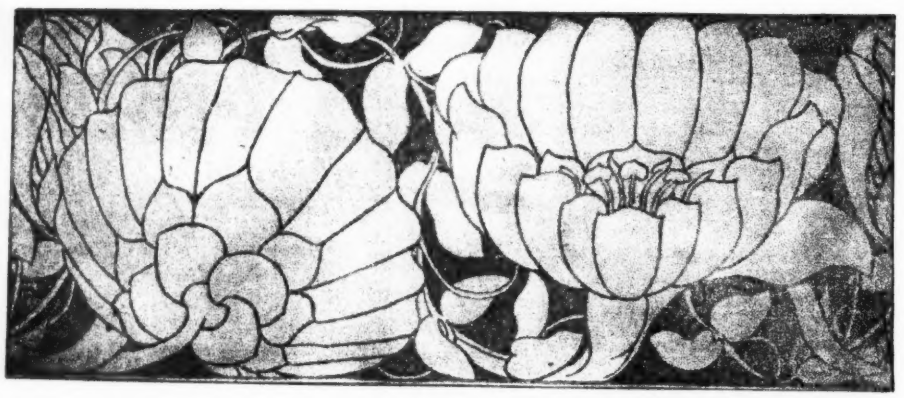

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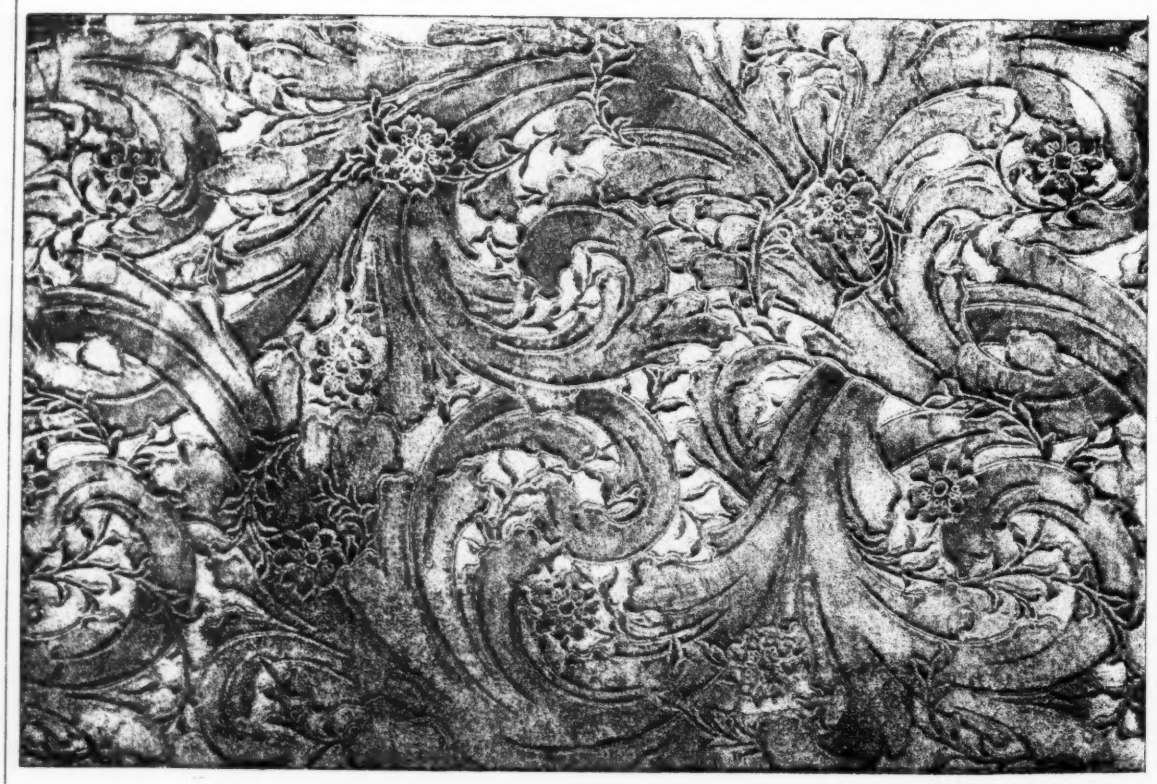

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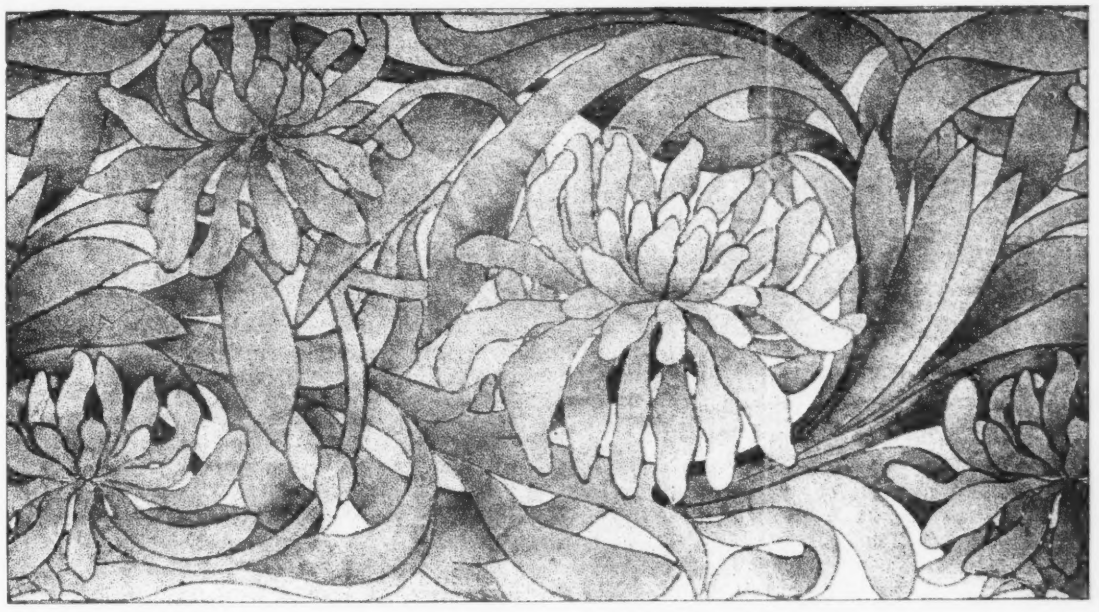

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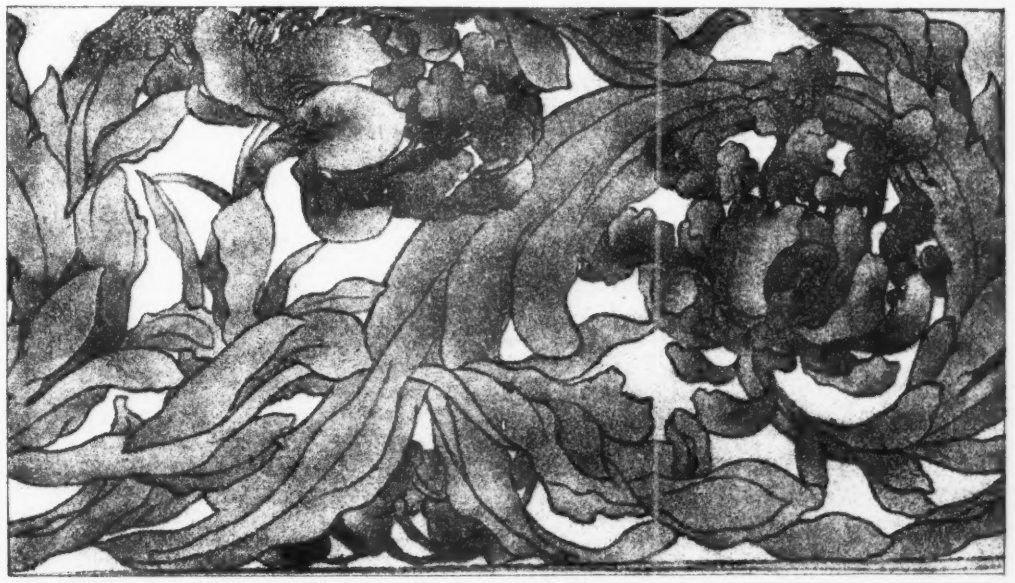

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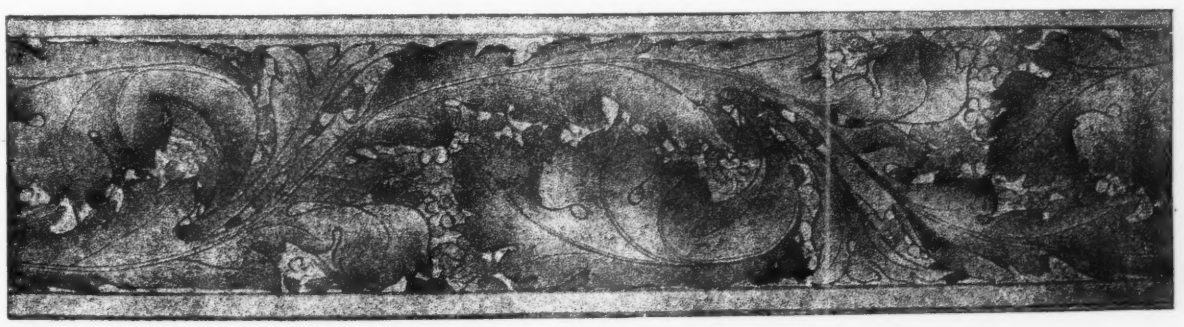

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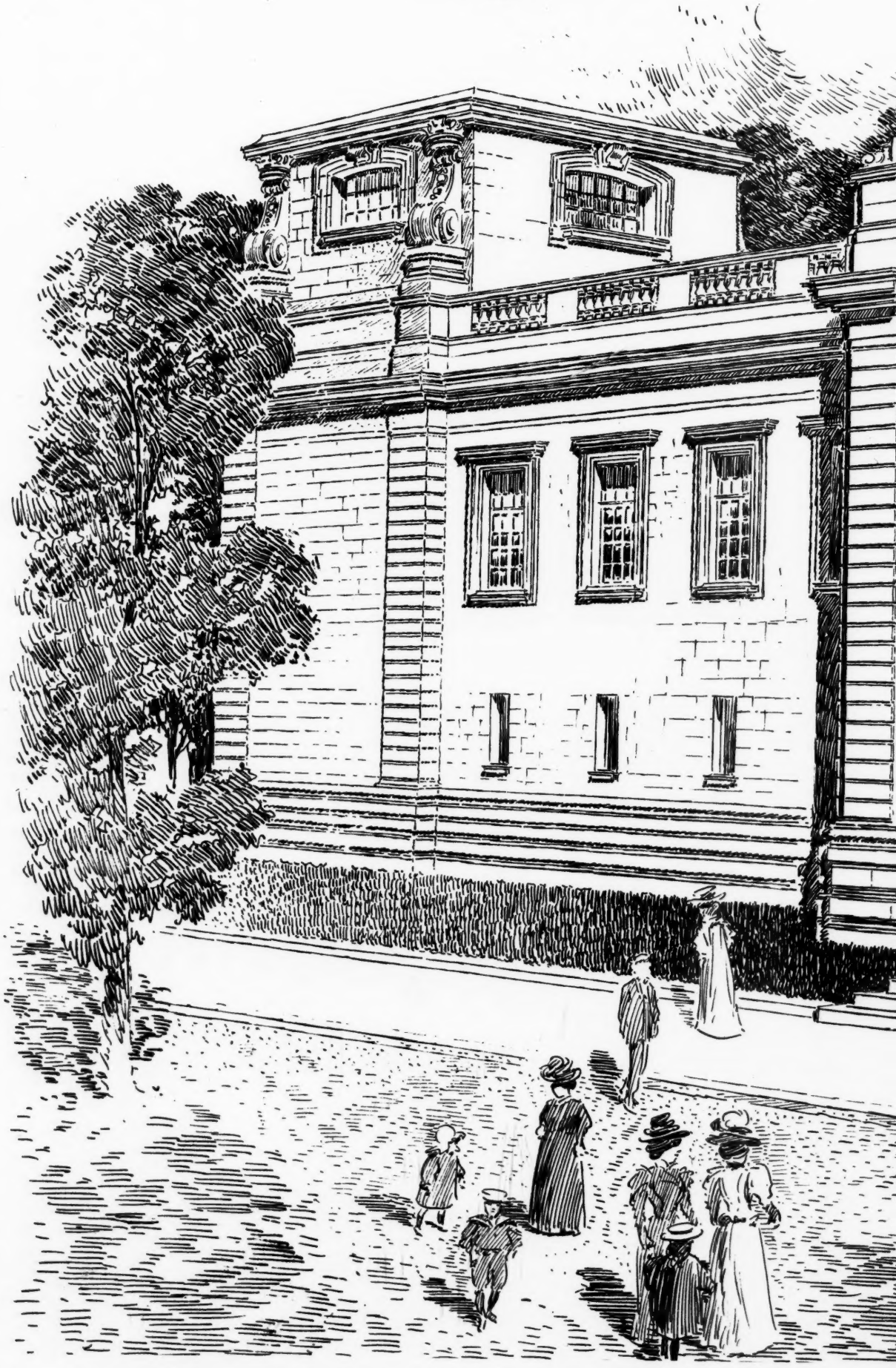

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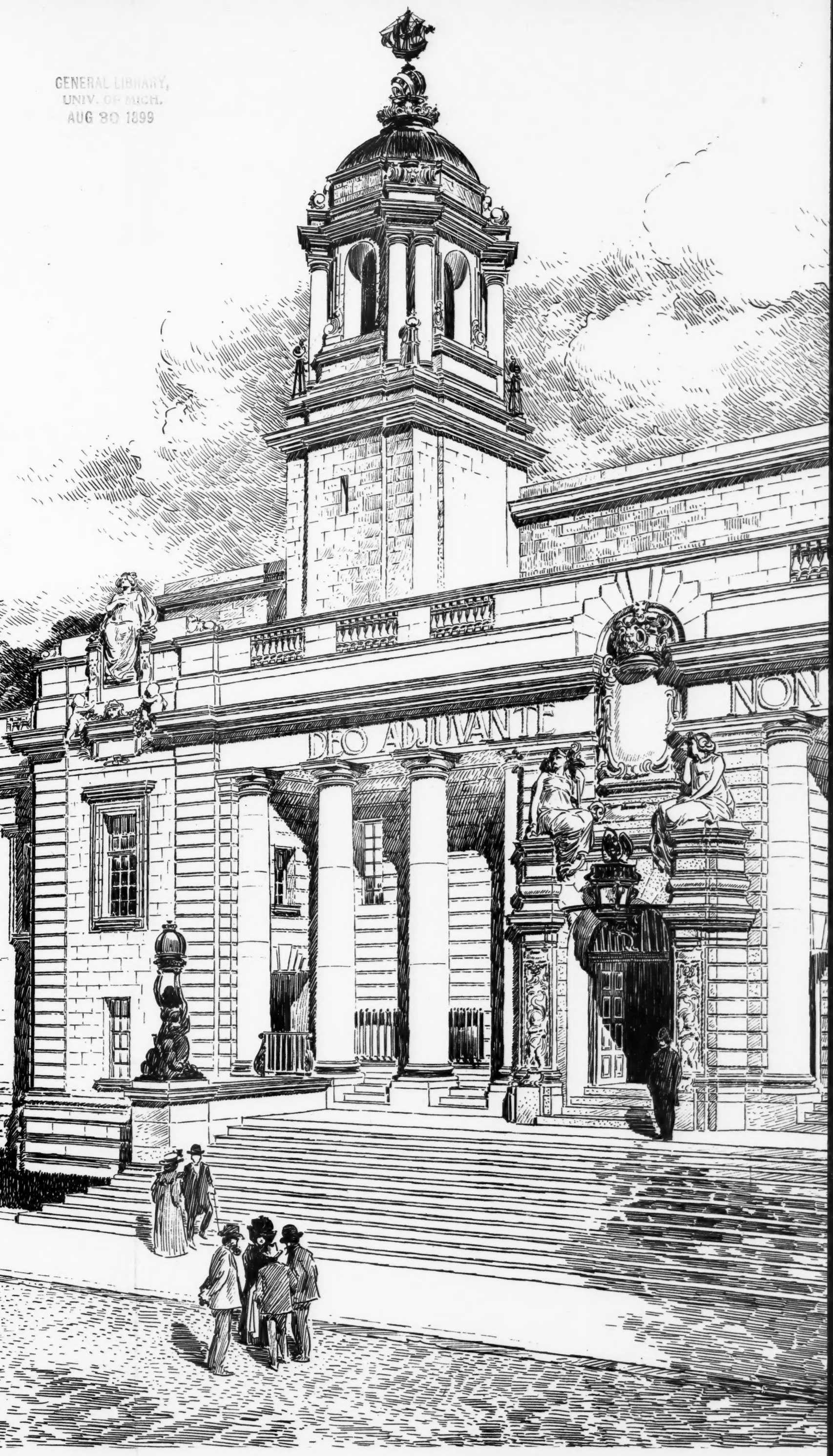

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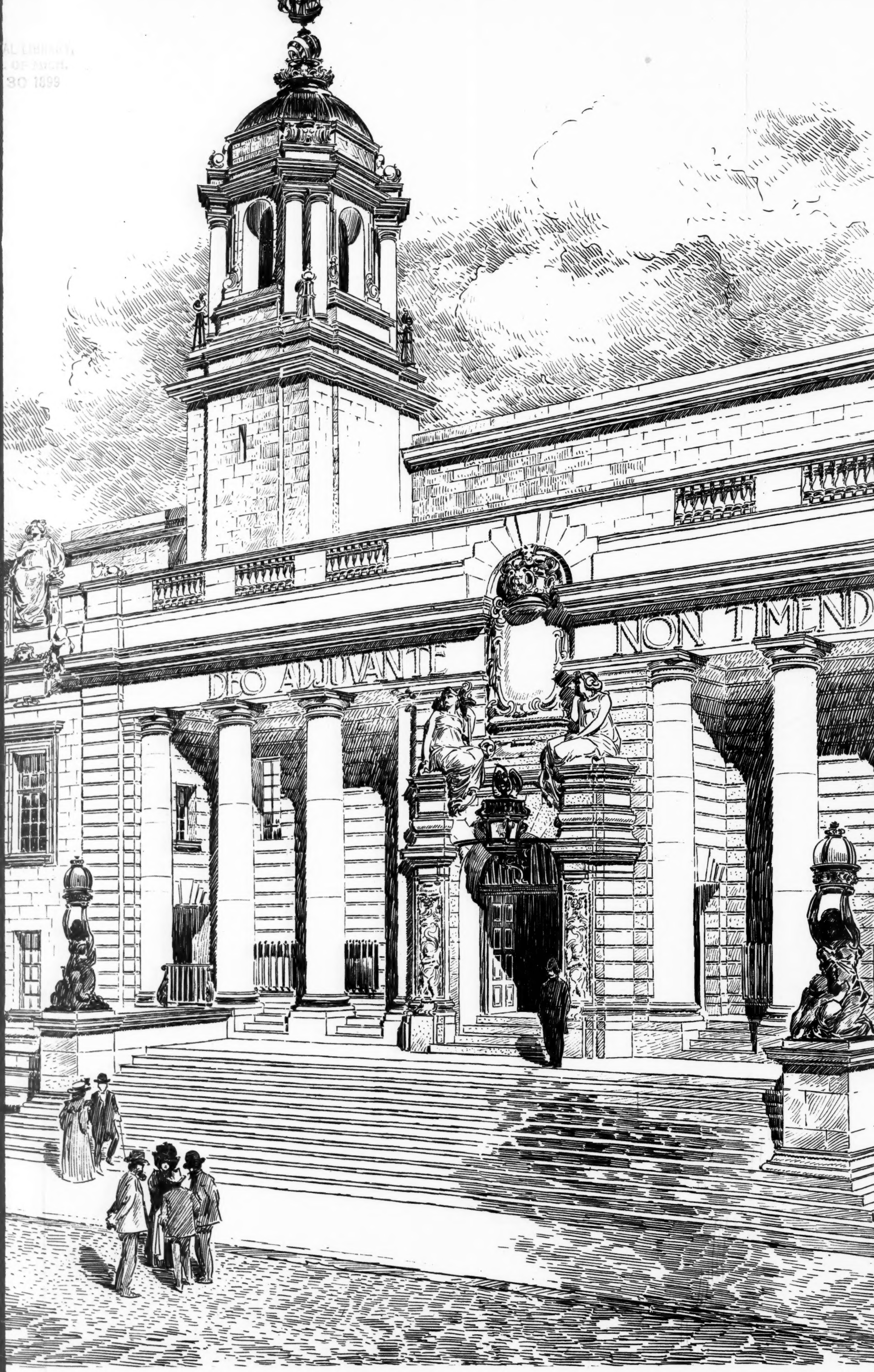

E.A.RICKARDS. DEL. 1899.

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